SPATIAL DIVERSIFICATION OF INDUSTRIES

(A STUDY IN UTTAR PRADESH)

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Preface

The present study attempts an empirical examination of the traditional theoretical propositions on industrial location and assessment of the impact of official and institutional efforts to bring about regional balance in industrial development. In the process the locational structure of industries in Uttar Pradesh has been examined in detail on the basis of secondary as well as primary data, and a number of policy implications, particularly concerning industrial development of backward areas, have been brought out. The study is, therefore, expected to be of interest to academics and policy makers alike.

Material contained in Chapters I to III was also used earlier in an article on 'Spatial Diversification of Manufacturing Industries' included in <u>Studies on Development of Uttar Pradesh</u>, by TS Papola, <u>et al</u>, published by Giri Institute of Development Studies.

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INTRODUCTION

The Problem

The theoretical analysis of the problems of location
and spatial dispersal of industrial activities has been
traditionally carried out on the basis of a relatively
simple framework : natural endowment of a location as
represented by the availability of basic raw materials,
and nearness to the market are presumed to determine the
spatial distribution of industrial activity. There are
at least two important developments in the past decades
that have necessitated a re-examination of location models
based on this simple framework. These are : one, certain
basic structural changes in the manufacturing activity,
and two, emergence of policy considerations in favour of
spatial balance in location of industrial activity.

Traditional theories of location and spatial diversi-
fication were formulated in a period when the industrial
structures of most of the spatial units were still dominated
by natural resource-based and directly consumer-oriented
industries. The optimum location was simply determined by

the balance between location of raw material and market,
on the one hand, and weight-distance characteristics of
material and output, on the other. If the transport
charges per unit of weight-distance did not significantly
differ, as happened most of the time, the end-locations
provided the optimum : the activities requiring weight
losing materials got located at the raw material head and
those requiring weight gaining material and careful and
costly transport of final output got located nearer the
market. Thus we have sugar factories located near sugar-
cane fields, and aerated soft drink plants located near
the market. The changes in the structure of industries
that have taken place, specially over the last half century,
however, make it extremely difficult to classify them in
terms of locational characteristics in the simple dichoto-
mous scheme, and analyse them with the help of merely
location and weight characteristics of raw material and
market. First, the industrial structure has acquired an
increasing proportion of such industries which are not
predominantly natural resource and raw material-based.
Second, processes of production have so changed that many
units do not use nature-based raw material but semi-
processed or intermediate products as the major input in

their production; while, therefore, a number of others
does not produce for the final consumer, but only for other
producers. Third, with the change in technology, organisa-
tion and size of production units, factors, such as infra-
structure, power, cheap and 'submissive' labour force,
finance etc., along with the supply of raw material and
the market have become equally important, if not more.
Fourth, the marketing system has also undergone changes
with large scale production : a linear treatment of distance
to market is too simplistic a tool to take care of the
increasingly large number of space units providing the
market; and many of the producers do not directly sell to
the consumer. Therefore, what is of immediate importance
is not the location of the market as such but availability
of marketing arrangements and networks. Availability of
transport facilities (not just the transport cost), infra-
structure facilities, finance, industrial agglomerations
to procure and sell intermediate products, and marketing
network seem to have emerged as significant factors in
location, sometimes overshadowing the importance of basic
raw material and the location of the ultimate market.

The other significant development consists of the
increasing concern of the policy makers for reducing
regional disparities in levels of development and industrial
activity which result from the unregulated operation of
the location mechanism based on the resource endowment and
nearness to market alone. The policy instruments have
therefore been evolved to mitigate the disparate effects
produced by free play of market forces. Industrial policy
in India, for example, has emphasized this aspect continously
since mid-fifties. A panel appointed by the Government of
India classified regions and districts of the country into
industrially backward and non-backward ones and another
panel recommended policy instruments, particularly in terms
of incentives and subsidies to be offered to entrepreneurs
who locate their units in backward areas. The Central and
State governments have evolved a number of programmes and
instruments to diversify industries in favour of backward
areas. Location of some large public undertakings in
backward regions, industrial estates programme, central
capital subsidy, tax concessions, concessional terms of
loan assistance and raw material and marketing assistance
are some of the important instruments used for achieving
the objectives of diversification and industrial development

of backward areas. Besides, the licensing authorities are also expected to consider backward area location as a favourable factor in deciding on licence applications.

Still, the traditional framework can take care of most of these complications to the extent the assumption, that an entrepreneur aims at profit-maximising location, holds good; and, whatever material and policy factors operate to ultimate affect either the revenue or cost or both in a location. Further, even the profit maximisation assumption cannot be, taken for granted in an absolute sense, as there are non-economic reasons and constraints in operation. The entrepreneur may have his personal, non-pecuniary preferences for a location which is not necessarily the maximum profit location. There may be in operation certain policy instruments either inducing entrepreneurs to go to less favoured locations by offering pecuniary attraction or forcing them away from industrially developed areas by prohibiting instalation of new units and expansion of old ones in such areas. In an economy primarily based on private enterprise, the policy instruments may have to be basically of a compensating nature : most of the time an entrepreneur may

have to be given adequate pecuniary compensation to
mitigate the cost and profit disadvantage and loss of
amenities of life that a particular less favoured location
offers.

What is important, however, is that a larger number
of variables than merely the locationand weight characteri-
stics of material and output, and location of market, need
to be included in the explanatory framework. It is obvious
the proposition that
that/the transport cost of material and output alone makes
the difference is not valid, as even the 'ubiquities' are
not always available at the same price due to differences
in the demand-supply conditions of non-movable factors like
land, and owing to the relative lack of mobility even among
mobile factors like labour. On the other hand, certain
materials, mainly universal intermediaries like cement and
steel, sometimes assume the nature of 'ubiquities', as a
result of the government policy of making them available at
the same price irrespective of transport cost incurred to
reach them at different locations.

The Present Study

An analytical framework to explain the pattern of
industrial location needs, therefore, to be evolved through

indepth empirical studies, which could take care of
the aforesaid/variables and propositions. There are two
main inter-related issues which are of our concern in
the present study of location of factories in Uttar
Pradesh : (i) an examination of the adequacy of the
traditional analysis of location to explain the pattern
of industrial location; and (ii) an assessment of the
impact of policy instruments on the pattern of industrial
location in the State *of Uttar Pradesh.* The vast geographical area of the
State and extreme variations in levels of industrial
activity, provide a good enough scope for examining the
propositions outlined here. And extremely low levels of
development, in general, in regions with very low levels
of industrial activity makes such a study useful from
policy viewpoint as well. Specifically, the study attempts
(a) a portrayal of the spatial pattern of industries among
various districts and regions; (b) an analysis of the
pattern of location of new factories and employment added
during 1960-75, in terms of certain characteristics of
different districts, including indicators of institutional
efforts made in this regard; (c) an analysis of entrepre-
neurs' motivation and perception in regard to locational
decisions; (d) measurement of relative cost situation in

different districts and its relation with the incremental industrial activity; and (e) an examination of the extent of availment of institutional facilities and incentives and the entrepreneurs' knowledge and perception about them.

The analysis for (a) and (b), reported in chapters II and III has been conducted on the basis of secondary data. The details relating to the number of factories and employment were collected from the office of Chief Inspector of Factories, U.P., Kanpur and data relating to explanatory variables used in analysis were compiled from various published sources and concerned government offices. For (c) (d) and (e) in the subsequent para

The information used in chapters IV, V and VI has been collected from a sample of 292 factories spread in 19 22 districts and 15 industrial groups, as detailed in chapter IV (Table IV.1). The procedure followed for sampling is briefly as follows : In the first instance, considering the time and resource constraints, it was decided to confine the survey to around 300 selected factories. Next, industry groups were selected on the basis of their importance in the State's industrial structure and location in at least 10 of the districts. The largest industry, sugar was left out for the reason that economics of its location is simple:

due to its high weight losing character it always gets
located at the source of raw material. Cotton textile was
also left out as it has traditionally been concentrated
in a few districts only. In the selection of industries,
we intended to go into as disaggregated level as possible
but, given the non-availability of necessary details regard-
ing the specific products of factories before hand, and the
necessity to have the selected industry at least in ten
districts, we went upto 4-digit level in the Standard Indus-
trial Classification. Once industries were selected on the
above basis, the districts in which units in the selected
industries were located got selected themselves. To begin
with, a ten per cent sample on a proportionate probability
basis was selected in each industry, with the proviso that
a minimum of one unit is selected from a district, in order
to ensure larger number of districts for an industry; but
if a district gave only one or two units in the aggregate
sample it was dropped. With all these adjustments a tentative
sample of 485 factories got selected; but due to non-trace-
ability, closure, shifting of location, non-response and
incomplete information, the effective sample consisted of
292 units. A structured questionnaire was used for collect-
ing information from the selected factories, which was
personally administered by a team of investigators.

Chapter II

SPATIAL STRUCTURE OF INDUSTRIES IN UTTAR PRADESH

The factory sector of the industrial economy of
the State has experienced considerable growth during the
last two decades. The number of factories has increased
at an average annual rate of 5.48 per cent and that of
factory workers, at 3.43 per cent during 1960-75. These
compare favourably with the corresponding all-India
figures of 6 and 2.5 per cent during this period. What
is more significant to note, from the viewpoint of geo-
graphical diversification of industries in the State, is
the fact that the structure of industries has experienced
a change in favour of industries whose location is not
heavily based on the availability of materials locally.
There has been a relative decline in the employment share
of industries not using locally produced material such
as cotton textiles where it has declined from 37 to 31 per
cent, and an increase in the share of capital and inter-

mediate products from 32 to 40 per cent. Among the
important industries (contributing at least 2 per cent
of employment), the fastest growth in factory employment
has been experienced by units providing electrical
machinery and apparatus, non-ferrous metal, chemicals and
chemical products, iron and steel, metal products, pulp
and paper board, rubber and plastic products and glass
products, each having at least doubled its factory employ-
ment in 1975 over 1960.

Changes in Spatial Distribution

There, however, seems hardly any significant change
in the overall spatial pattern of manufacturing activities
in the State during this period. No doubt, the most
industrialised district, namely, Kanpur now claims only
17 per cent of total factory employment in the State as
compared to 26 per cent in 1960. But the gains of this
relative decline have gone only to some other industrially
better developed districts. So that the five districts with
the largest factory employment in the State, namely, Kanpur,
Meerut, Lucknow, Agra and Gorakhpur, alone had 57 per cent
of the total employment in 1960 and 55per cent in 1975.

Among themselves their relative positions have shifted;
Lucknow and Meerut have gained, Kanpur and Gorakhpur have
had a relative decline in their shares, and Agra has
maintained its position with some improvement. At the
bottom, the 10 industrially least developed districts
namely, Rae Bareli, Pratapgarh, Ballia, Sultanpur, Jalaun,
Tehri Garhwal, Hamirpur, Badaun, Garhwal and Banda together,
shared 1.10 per cent of State's factory employment in 1960;
in 1975 their share was reduced to 0.56 per cent. Over
all, the Gini coefficient of district-wise distribution of
factory employment worked out to 0.6787 in 1960 and 0.6806
in 1975.

It is also worthwhile to examine the distribution of
industrial activity between the notified 'backward'
districts and others. 40 of the 56 districts of the State
are notified as industrially backward and six (seven)
districts (Almora, Ballia, Basti, Faizabad, Jhansi inclu-
ding Lalitpur and, Rae Bareli) as specially backward. A
number of concessions and incentives are available to
units in these districts. Most of the term loans provided
by the term lending institutions and also the State Govern-
ment Sales Tax Refund Loans are available in backward
districts on concessional terms. Exemption is also provided

from income tax, octroi duty, sales tax, electricity
duty etc., under certain conditions and for a specific
period of time. In specially backward districts, units
are also eligible for an outright subsidy to the extent
of 15 per cent of their capital investment from the Central
Government. In view of all this it would be reasonable
to expect that these districts would attract a larger per-
centage of incremental industrial activity than what they
obtained in the base year.

This expectation is, however, not found to have been
fulfilled. In fact, the position of the notified backward
districts has somewhat deteriorated. Given the fact that
almost three-fourths of the districts are in the backward
category, a share as low as 18 per cent in factory units and
15 per cent in factory employment indicated a very high
inequality of distribution of industrial activity across
the districts in 1960. In 1975, the situation worsened as
the share of these districts declined slightly in factory
units and by over 2 per cent points in employment. The
'specially' backward districts experienced an increase in
their employment share but it seems to have been contributed
mostly by expansion in old units rather than due to the

Table II.1

Distribution of Activities Between Backward and Non-backward Districts(%)

	Factories			Factory Employment		
	Back-ward Distts.	Specia-lly back-ward Distts.	Oth-ers	Back-ward Distts.	Specia-lly back-ward Distts.	Others
1960	17.77	2.79	82.33	15.34	3.21	84.66
1975	17.32	1.91	82.68	13.22	4.36	86.78
Share in increase during 1960-1975	16.97	0.87	83.03	9.14	6.59	91.86

establishment of new factories. It is interesting to note that the notified backward districts which have attracted a significant proportion (around 1% or more) of the new factories are not so backward and adjoin some industrially better developed districts as can be seen from Table II.2. In fact, 5 of the 8 such districts are in western U.P. a industrially better developed region generally. Thus, the major part of the new industrial activity ~~remaining~~ going to the group of backward districts, seems to have got concentrated in such backward districts which are in proximity of some better developed, non-

Table II.2

Location of Backward Districts Claiming Significant Number of Factories

Backward Districts claiming significant % of new factories	% of new factories claimed	Bordering or neighbouring non-backward districts
1. Azamgarh	2.15	Gorakhpur, Varanasi
2. Unnao	2.01	Lucknow, Kanpur
3. Sitapur	0.98	Lucknow, Kheri
4. Etawah	0.90	Kanpur
5. Mathura	2.01	Agra, Aligarh
6. Moradabad	5.33	Meerut, Bareilly, Bijnor
7. Rampur	1.03	Bareilly, Nainital
8. Shahjahanpur	2.30	Bareilly, Kheri

backward districts. It appears that incentives and concessions tend to act as inducement more in such districts than in the really backward and remote districts, may be because the latter present a much more disadvantageous position than the backward districts in proximity to developed ones.

The highly uneven distribution of industrial activity among districts has roots in the historical evolution of industries in the past, particularly in the dominance of

raw material-based industries in the industrial
structure and differences in the districts' endowments.
Today, however, the State's industrial sector is very
well diversified and a large part of its industrial
activity is not necessarily based on local raw material
or demand as such. The footloose industries which do
not have any particular locational advantage in terms of
raw material availability in one region as compared to
others are the ones which have increased in relative
importance over the last two decades. It is, therefore,
disappointing to find that there has been no significant
trend towards spatial diversification of manufacturing
activity in the State.

That the State's industrial structure today has a high
degree of locational flexibility is evident from the fact
that of the 20 most important industries in the State, as
many as 16 have their units located in more than 10
districts, mostly in different parts of the State. For
example, spinning and weaving of textiles, the second largest
factory industry of the State contributing around 15 per
cent of employment in this sector, is located in as many as
27 districts spread over the entire State. The most important

industry, sugar, however, is a raw material-based industry, and does not provide much locational flexibility. Still it has factories in 35 districts, but employment in this industry in eastern districts has not kept up with the overall growth of industry in the State. Glass and glass products, another important and fast growing industry, has also its factories located in quite a few (15) districts. Among other important industries, repair of motor vehicles has factories in 42 districts, miscellaneous food products, in 38 districts; basic metals in 27 districts; metal products in 18 districts; electrical machinery in 15 districts; basic chemicals in 23 districts; and non-ferrous metal products in 18 districts. Thus, the State's industrial structure seems to have a good potential for locational diversification among various districts and regions.

Industrial Base and Specialisation of Districts

Before we attempt an analysis of factors responsible for leading to uneven distribution of new industrial activity, we would like to probe a little further into some aspects of locational structure of manufacturing activity in terms of districts' pattern of manufacturing activity and their industrial base and specialisation.

In the first instance, we tried to look at the specialisation pattern of districts, with the help of co-efficients of specialisation for each district. Besides, indicating how different a district's industrial pattern is from that of the State as a whole, a comparison of coefficients for 1960 and 1975 also suggests whether the district's industrial pattern has become more diversified or concentrated over the period. The coefficient of specialisation for a district (S_j) is defined as:

$$S_j = \sum_{i=1}^{n} \left/ \frac{e_{ij}}{EJ} - \frac{E_i}{E} \right.$$

where:

e_{ij} = employment in ith industry in jth district

EJ = employment in all industries in jth district

E_i = employment in ith industry in the State

E = employment in all industries in the State

When S_j is found to be 0, the district's industrial structure is as diversified as that of the State and when it is found approximately 1, the district's industrial employment is highly concentrated in only one or a few

industries. The computed coefficients of specialisation for each of the districts for 1960 and 1975 are given in Table II:3.

There is no reason to expect each of the districts to have factories in all of the State's industries and district's employment structure the same as of the State. In any case, a district's industrial structure cannot be any more diversified than the State's. The reason, however, as to why a diversified structure of a district is considered encouraging, lies in the fact that the industries have direct as well as indirect linkages with each other, and, therefore, existence of a larger number of directly or indirectly inter-connected industries is considered to provide a better potential for overall industrial growth of the district, than a narrow base consisting of one or a few district industries. Empirically also it has been found that districts with a diversified industrial structure are also the ones which have the highest level of industrial activity. In fact, this relationship is found to hold consistently across the districts in the State as is evident from a highly significant coefficient of correlation (-0.6694) between the coefficient of specialisation and number of factory workers in each district.

Table II:3

Extent of Industrial Diversification/Specialisation of Districts in 1960 and 1975

District	S_j1960	S_j1975	District	S_j1960	S_j1975
Almora	0.7548	0.8123	Deoria	0.6148	0.6822
Pithoragarh	-	0.9730	Faizabad	0.3905	0.4825
Dehradun	0.2309	0.2205	Ghazipur	0.9413	0.8331
Garhwal	0.8835	0.5875	Gonda	0.5835	0.6979
Nainital	0.6308	0.5711	Gorakhpur	0.2053	0.3566
Tehrigarhwal	0.9563	0.9543	Jaunpur	0.5254	0.6150
Uttarkashi	-	0.9750	Mirzapur	0.6035	0.4815
Banda	0.9579	0.9895	Pratapgarh	0.5070	0.9298
Hamirpur	0.7133	0.9506	Sultanpur	0.9291	0.8639
Jalaun	0.9941	0.9777	Varanasi	0.5620	0.1211
Jhansi	0.4391	0.6634	Agra	0.1278	0.3294
Barabanki	0.9977	0.7184	Aligarh	0.3050	0.1967
Fatehpur	0.6404	0.8847	Bijnor	0.3379	0.4316
Hardoi	0.7479	0.7971	Badaun	0.6675	0.6438
Lucknow	0.5171	0.2227	Bareilly	0.1932	0.3857
Kanpur	0.3551	0.1015	Bulandshahr	0.6840	0.6627
Rae Bareli	0.9705	0.7552	Etah	0.6791	0.6024
Sitapur	0.6017	0.3943	Etawah	0.8366	0.8319
Unnao	0.8135	0.4382	Farrukhabad	0.5845	0.4920
Kheri	0.7748	0.7766	Mainpuri	0.8243	0.7629
Allahabad	0.4914	0.3710	Mathura	0.1416	0.4808
Azamgarh	0.6563	0.5504	Meerut	0.1285	0.0053
Bahraich	0.4660	0.6698	Moradabad	0.4719	0.1393
Ballia	0.6986	0.9302	Muzaffarnagar	0.5846	0.4182
Basti	0.4881	0.5681	Rampur	0.8076	0.4520
Pilibhit	0.7481	0.7866	Saharanpur	0.2799	0.2874
			Shahjahanpur	0.5168	0.6602

Most of the districts of the State, however, show a highly concentrated rather than diversified pattern of factory employment among industries. All the Hill districts (except Dehradun), all the districts in Bundelkhand, most of the districts in Central region (except Lucknow, Kanpur, Unnao and Sitapur), all Eastern districts (except Allahabad, Gorakhpur and Varanasi) have coefficients of specialisation higher than 0.5; 11 of 18 Western districts, however, show a more diversified pattern with $S_j < 0.5$. On the whole there seems to have occurred a decline in disproportionate specialisation over the period 1960-75 in most of the districts, as shown by generally a lower value of S_j in 1975 as compared to 1960. Bundelkhand districts, however, have revealed a reverse trend. So have a number of districts in Eastern region, viz., Baharaich, Ballia, Basti, Deoria, Faizabad, Gonda, Gorakhpur, Jaunpur and Pratapgarh. The districts which have achieved a substantial degree of diversification over the period are : Lucknow, Kanpur, Unnao, Varanasi, Meerut and Moradabad. Agra, Bareilly and Mathura, on the other hand, seem to have developed a more concentrated structure of factory employment over the period.

While districts with less diversified structure have only a few industries which could be considered their industrial base, even the districts with relatively diversi-

fied structure cannot claim to have all the industries in which factories are located in their jurisdiction as their industrial base. In a general sense, the industrial base of a region is defined in terms of the industries in which a district has relatively higher level of activity, let us say, more than proportionate share of employment. We would try to examine this aspect with the help of location quotients. Location quotient for an industry in a district is defined as:

$$ l_{ij} = \frac{e_{ij}}{E_j} \Big/ \frac{E_i}{E} , $$

the various terms representing the same variables as in case of coefficient of specialisation. Industries with $l_{ij} > 1$ in any district are supposed to constitute the industrial base of that district. On this basis industries which constitute industrial base of various districts in the State are listed below (figures in brackets are value of l_{ij}).

Table II : 4
Industrial Base of Districts in Uttar Pradesh

Districts	Industries with $l_{ij} > 1$
Almora	Miscellaneous food preparations(7.8), Wood and Cork (4.07), Miscellaneous chemical products (47.7).
Pithoragarh	None

Industrial Base of Districts in
Uttar Pradesh
(contd.)

Districts	Industries with $l_{ij} > 1$
Dehradun	Miscellaneous food preparations (4.50), manufacture of wood and cork (3.22), printing, book binding etc. (4.02), basic chemical products (3.51), electrical machinery (3.48); repair of motor vehicles and cycles (1.96), scientific instruments (7.19), jewellery and related articles (2.30).
Garhwal	Grain mill products (13.21), miscellaneous food preparations (2.199), boots and shoes (17.43); rubber and rubber products (15.37), musical instruments (30.62).
Nainital	Dairy products (52.00), canning and preservation of fruits and vegetables (9.75), grain mill products (2.73), sugar (2.19), miscellaneous food preparations (6.97), wearing apparels (6.12), wood and cork (3.45), miscellaneous chemical products (6.54), repair of motor vehicles and cylces (3.70).
Tehri-Garhwal	Printing, book binding (2.188)
Uttar Kashi	Electrical machinery (40.00)
Banda	Grain mill products (9.52).

Industrial Base of Districts in Uttar Pradesh
(contd.)

Districts	Industries with $l_{ij} > 1$
Hamirpur	Repair of motor vehicles and cycles(20.24)
Jalaun	Pulp paper and paper board (74.22), rubber and rubber products (15.33).
Jhansi	Miscellaneous chemical products (1.24), structural clay products (30.50), miscellaneous nonmetallic mineral products(5.78), railroad equipment (manufacturing and repair) (5.78), repair of motor vehicles and cycles (9.42).
Fatehpur	Grain mill products (41.08), miscellaneous food products (2.66), vegetable and animal oil (10.60), iron and steel (10.23).
Hardoi	Sugar (4.43).
Lucknow	Grain mill products (2.00), distilling, rectifying and blending of spirits (5.12), wine (1.62), cordage, rope and twine (1.85), wearing apparel (1.00), printing, bookbinding etc.(4.8), leather and tanneries, chemical products (1.65), other non-metallic mineral products (3.12), metal products(1.33), manufacture and repair of railroad equipment (4.72), motor vehicle (5.72), repair of motor vehicles and cycles (1.58), scientific instruments (2.29).

Industrial Base of Districts in Uttar Pradesh
(contd.)

Districts	Industries with $\hat{\ell}_{ij} > 1$
Kanpur	Grain mill products (1.27), bakery products (2.58), soft drinks and carbonated water (1.25), tobacco products (4.03), spinning, weaving and finishing of textiles (119.70), knitting mills (1.67), cordage, rope and twine (1.20), weaving apparel (2.75), tanneries and leather finishing (4.88), rubber products (2.24), chemicals (1.46), motor vehicles (2.81), bicycles (1.36), scientific instruments (1.05), photographic and optical goods (1.00).
Rae Bareli	Spinning, weaving, and finishing of textiles (2.57), cordage, rope and twine (37.19), wood and cork products (12.40), non-metallic mineral products (5.87), metal products (1.33), electrical machinery (10.96).
Barabanki	Sugar (3.19), basic chemicals (12.59), miscellaneous chemical products (1.66), non-metallic products (6.36).
Sitapur	Grain mill products (1.47), bakery products (2.79), miscellaneous food products (6.25), cordage, ropeand twine (2.27), wood and cork products (53.30).

Industrial Base of Districts in Uttar Pradesh
(contd.)

Districts	Industries with $i_{ij} > 1$
Unnao	Distilling, rectifying and blending of spirits (12.98), tobacco manufacture (3.01), manufacture of boots and shoes (29.12), furniture and fixtures (13.17), pulp paper and paper board (1.54), tanneries and leather finishing (12.42), rubber products (1.36), basic chemicals (12.27), vegetables and animal oil (12.00), chemical products (1.48), non-metallic mineral products (3.16), iron and steel (3.61), musical instruments (2.92).
Kheri	Sugar, sugar confectionary (349.00).
Allahabad	Canning and preservation fof fruits and vegetables (13.90), bakery products (4.21), spinning weaving and finishing of textiles (1.16), furniture and fixtures (1.73), pulp paper and paper board (1.46), printing, book binding etc. (3.87), rubber products (1.22), chemical products (2.31), non-metallic mineral products (2.52), machinery (1.18), electrical machinery (10.99), scientific instruments (2.09), jewellery and related articles (10.00).
Azamgarh	Spinning, weaving and finishing of textiles (4.09), repair of motor vehicles and cycles (1.32).

Industrial Base of Districts in Uttar Pradesh
(contd.)

Districts	Industries with $l_{ij} > 1$
Bahraich	Grain mill products (18.76), sugar (2.03), miscellaneous food products (2.94), cement (17.82), repair of motor vehicles and cycles (3.51).
Ballia	Miscellaneous food products (17.05), repair of motor vehicles and cycles (13.20).
Basti	Canning and preservation of fruits and vegetables (15.50), bakery products (43.67), sugar (3.91).
Deoria	Sugar (4.78), distilling, rectifying and blending of spirits (3.53).
Faizabad	Sugar (1.64), miscellaneous food products (1.31), spinning, weaving and finishing of textiles (1.76), wood and cork (4.28), pulp paper and paper board (6.47).
Ghazipur	Pottery, china and earthenware (184.00).
Gonda	Grain mill products (2.00), sugar (3.70), distilling, rectifying and blending of spirits (13.21), wines (15.23), wood and cork (7.75).
Gorakhpur	Sugar (1.85), printing, book-binding etc. (21.15), basic chemicals including fertilisers (10.95), iron and steel (1.00).

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Industrial Base of Districts in Uttar Pradesh
(contd.)

District	Industries with $l_{ij} > 1$
Jaunpur	Bakery products (4.71), sugar (2.38), miscellaneous food products (4.68), basic chemicals (1.47), iron and steel (2.86), machinery(1.56), repair of motor vehicles and cycles (3.41).
Mirzapur	Basic chemicals (1.54), cement (29.49), non-metallic mineral products (1.41), non-ferrous metal and metal products (23.57).
Pratapgarh	Miscellaneous food products (14.56), repair of motor vehicles and cycles (14.23).
Sultanpur	Wood and cork (36.68), iron and steel (1.32), metal products (3.56), repair of motor vehicles and cycles (13.36).
Varanasi	Bakery products (1.13), soft drinks and carbonated water (1.75), knitting mills (8.59), cordage, rope and twine (8.00), weaving apparel (3.88), basic chemicals (4.71), nonmetallic mineral products (1.56), machinery (3.14), electrical machinery (2.41), railroad equipment (2.96), repair of motor vehicles and cycles (1.03), manufacture of bicycles (2.94), scientific instruments (7.05).
Agra	Miscellaneous food products (1.71), soft drinks and carbonated water (1.125), knitting mills (4.00), miscellaneous textiles (2.00), boots and shoes (1.87), furniture and fixtures (1.87), glass and glass products (7.79).

Industrial Base of Districts in Uttar Pradesh
(contd.)

District	Industries with $l_{ij} > 1$
Aligarh	Dairy products (4.19), grain mills products (1.11), miscellaneous food products (3.44), printing, publishing and book-binding (2.27), vegetable and animal oils (5.00), metal products (3.92), aircraft manufacture (27.70), musical instruments (7.04).
Bijnor	Sugar (4.28), wood and cork (1.53), repair of motor vehicles and cycles (1.52).
Badaun	Sugar (1.52), miscellaneous food products(6.19), pulp paper and paper board (18.35), basic ferrous metals (4.60), repair of motor vehicles and cycles (3.05).
Bareilly	Sugar (1.05), miscellaneous food products (2.82), distilling, rectifying and blending of spirits (1.28), soft drinks, and carbonated water (12.25), wood and cork (1.70), printing, bookbinding etc. (3.91), machinery (1.54), railroad equipment (3.87), repair of motor vehicles (1.11).
Bulandshahr	Sugar (2.67), miscellaneous food products(2.59), rubber and rubber products (2.89), chemical products (6.59), repair of motor vehicles and cycles (2.59).
Etah	Dairy products (9.54), grain mill products(1.33), sugar (3.11), miscellaneous food products(1.75), chemical products (2.63), metal products (1.30), repair of motor vehicles and cycles (1.48).

Industrial Base of Districts in Uttar Pradesh
(contd.)

District	Industries with $\hat{n}_{ij} > 1$
Etawah	Grain mill products (34.64), miscellaneous food products (1.61), tobacco products (16.26), chemical products (2.13), repair of motor vehicles and cycles (1.10).
Farrukhabad	Sugar (2.09), miscellaneous food products (13.14), tanneries and leather finishing (2.35), basic metals (1.79), repair of motor vehicles and cycles (1.85).
Mainpuri	Grain mill product (8.97), miscellaneous food products (2.16), pulp paper and paper board (3.21), vegetable and animal oil (2.67), electrical machinery (23.30), repair of motor vehicles and cycles (1.33).
Mathura	Grain mill products (5.66), miscellaneous textiles (138.50), pulp paper and paper board (2.12), printing, book-binding etc.,(1.02), basic chemicals including fertilisers (1.28), chemical products (1.67), pottery, china and earthenware (6.33), other non-metallic mineral products (33.59), basic metals (2.08), non-ferrous metals (9.85), metal products (3.42), machinery (2.42), repair of motor vehicles and cycles (1.06).
Meerut (including Ghaziabad)	Canning and preservation of fruits and vegetables (2.05), miscellaneous food products (1.27), breweries and incidental processes (5.17), soft drinks and carbonated water (1.81), spinning,

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Industrial Base of Districts in Uttar Pradesh
(contd.)

District	Industries with $\hat{l}ij > 1$
	weaving, and finishing of textiles (1.58), pulp paper and paper board (2.16), rubber and rubber products (4.05), chemical products (1.67), Pottery, china and earthenware (2.23), basic metals (1.67), machinery (3.42), electrical machinery (1.36), manufacture of bicycles (4.04), watches and clocks (6.71), jewellery and related articles (4.10), musical instruments (4.00).
Moradabad	Dairy products (2.05), sugar (3.35), non-ferrous metals (2.30), metal products (1.62), aircraft manufacture (19.90).
Muzaffarnagar	Dairy products (1.44), sugar (3.94), distilling rectifying and blending of spirits (2.14), vegetable and animal oils (10.00), basic metals (1.90).
Rampur	Sugar (3.00), cordage, rope and twine (3.85), chemical products (8.58), non-metallic mineral products (1.50).
Pilibhit	Grain mill products (1.07), sugar (4.87).
Saharanpur	Dairy products (10.50), sugar (1.34), wine (24.00), tobacco products (2.42), knitting mills (2.00), pulp paper and paper board(6.04), vegetable and animal oils (3.47), non-metallic mineral products (1.25), machinery (7.06), railroad equipment (2.38), Photographic and optical goods (4.00).

Industrial Base of Districts in Uttar Pradesh
(contd.)

District	Industries with $l_{ij} > 1$
Shahjahanpur	Grain mill products (1.63), sugar (4.10), miscellaneous food products (2.37), distilling, rectifying and blending of spirits (15.81).

The foregoing list of industries and their location quotients for different districts needs to be read carefully. Obviously, it does not mean that industries not mentioned in the list do not exist in a district, nor does it imply that industries mentioned are the largest ones in the district. Location quotient is a highly relative measure of specialisation, and when it is more than one for an industry in a district, as is the case of the industries in each district listed above, it only implies that the industry has a higher proportion in the district's industrial employment than it has in the State's industrial employment. A large number of industries with higher than one location quotient does not necessarily imply anything desirable or undesirable for a district. In fact, districts with highly diversified structure do not show a very high value of location quotient for specific industries, even though it may contribute a significantly high proportion of the State's industrial employment in each of them.

Industries with a higher than one location quotient are taken to constitute the industrial base of a region for the simple reason that a higher proportion of such industries within a region's industrial structure implies higher than average weightage of those industries in the district which might imply some locational advantage. Therefore, from a policy viewpoint, it is considered desirable to start with an emphasis on these industries, if the region's industrial development is to be accelerated. This approach also recognises the need for specialisation and futility of efforts to develop a highly diversified industrial structure at the level of micro-regions. It has much to commend itself at the level of district where attempt to develop all types of industries may not be meaningful and, therefore, a selective approach has to be adopted.

Locational Linkages Among Industries

The approach, however, becomes more effective if the clusters of industries constituting the industrial base of a region do not merely reflect the co-existence of various industries based on coincidental or historical circumstances, but also consist of sets of technologically inter-linked industries. On the basis of the generally *observed* pattern of inter-industry linkages, one could broadly

identify the following groups each consisting of
industries with possibilities of mutual input and market
linkages:

    (i)   Food processing industries (excluding sugar)

   (ii)   Sugar, gur, etc., and beverages.

  (iii)   Textile-based industries.

   (iv)   Leather-based industries.

    (v)   Forest-based industries.

   (vi)   Chemical and chemical-based industries.

  (vii)   Non-metallic mineral products group

 (viii)   Metals, machinery, instruments and
         transport equipment.

For achieving rapid industrial development simulta-
neously with better inter-regional spread of industrial
activity, identification of technologically-linked
clusters of industries and planning to develop them
area-wise is one of the most suitable approaches. While
certain districts and areas seem to have already/*developed* indus-
trial base around such clusters, the necessary links are
missing in a number of others. A tentative effort based
on the limited data and exercise given in preceding pages
results in the identification of the following pattern of
such clusters in various districts and regions:

1.   Among the eight districts of the Hill region, the only somewhat developed clusters are: food processing industries group in Nainital and a somewhat loosely connected group of metals and machinery products in Dehradun. While most of the districts in this region have demonstrated some potential for development of food processing, forest-based products and chemical products groups, there do not seem to have developed a complex of mutually linked industrial units in these potential groups of industries.

2.   Bundelkhand's industrial activity in the factory sector does not suggest the realisation of any of clusters, although a few industries in which the region seems to have relative specialisation, such as in the chemical group and machinery group in Jhansi, food group in Banda and rubber and plastics in Jalaun have potential of backward and forward linkages to develop other related industries.

3.   In the central region, Kanpur obviously has a strong textile based cluster, another based on metal and machinery group and also one based on leather. A plastic-cum-chemical cluster is also visible, even though in an embroyonic form. Unnao shows a very well developed cluster of

chemical-based and another of forest-based industries. Lucknow seems to have developed a base on transport equipment group of industries. Sitapur shows potential for developing a complex around food products group; and so does Kheri, to some extent. Rae Bareli's industrial base suggests two clusters; textile-based and metal-based; both being in embryonic stage at the moment. The same can be said about a food products-based cluster in Fatehpur.

4.   Eastern Uttar Pradesh districts seem to have potential for developing quite a few inter-related groups of industries. But only some of them are on the way of growing; food products group in Allahabad, Basti, Gonda, and Jaunpur; textile-based cluster in Varanasi; forest products-based group in Allahabad and metal-based clusters in Allahabad and Varanasi. The following clusters exist in an embryonic form : food products group in Bharaich and Faizabad; textile-based group in Allahabad and Azamgarh; forest-based group in Faizabad, Gonda and Sultanpur; chemical group in Gorakhpur, Jaunpur, Mirzapur and Varanasi, and metal products group in Sultanpur and Jaunpur. In western Uttar Pradesh the most well developed clustering is around metal products and machinery in Meerut, Mathura, Saharanpur and Bareilly; food products group in most of the districts; textile-based group in Agra and Saharanpur; forest-based cluster of industries in Bareilly and Saharanpur.

Chapter III

FACTORS IN LOCATION : SOME MACRO-VARIABLES

Turning to the analysis of the pattern of location
of the incremental industrial activity during the years
1960-75 we start with the simple proposition that the
new industrial activity tends to get located where
industries already exist. The proposition may be tested
both at all industry and individual industry level. If
validated, this hypothesis leads to somewhat discouraging
implications regarding diversification and calls for a
planned big push as the only solution to the development
of industrially backward areas; incentives and subsidies,
and success in locating one or few units would hardly
produce any effect. We have attempted to verify this
hypothesis by correlating the factory employment in 1960
with the increase that took place during 1960-75, in each
of the districts. The analysis attempted is for total
industrial employment and also for each of such 13 impor-
tant industries which are spread over at least 10 districts.

The coefficients of correlation between the base year
and incremental factory employment are presented in
Table III:5.

The distribution of total increase in factory
employment across districts is related, though weakly,
with the distribution that existed in 1960. It implies
that to a certain extent incremental industrial activity
has tended to go to districts with already relatively
high level of industrial employment. But the relation-
ship does not hold in case of individual industries: in
12 out of 13 industries considered here the additional
employment did not get distributed in the pattern obtain-
ing in 1960, and in the case of textiles and repair of
motor vehicles and cycles, it is highly significantly
different. The only industry where the distribution of
incremental employment had a significantly similar pattern
with that of 1960, is the manufacture of miscellaneous
food products.

Overall, therefore, the hypothesis that new factories
and employment in an industry tend to go to districts
where units in that industry already exist does not hold
in case of most of the industries, which augurs well for

Table III:1

Relation Between Base and Incremental Industrial Employment

Industry group	r between E. 1960 & $\triangle$E 1960-75	N
All industries	0.35*	51
206 Manufacture of bakery product	0.39	13
207 Sugar factories and refineries	0.21	34
209 Manufacture of miscellaneous food preparations	0.38*	39
231 Spinning, weaving and finsihing of textile	-0.79**	25
233 Cordage, rope and twine industries	-0.18	15
300 Rubber and rubber products	-0.09	17
311 Basic chemicals including fertiliser	-0.04	23
319 Manufacture of chemical products	-0.14	29
341 Ferrous--manufacture of iron and steel	0.17	27
342 Non--ferrous--melting and refining of metals	0.06	18
350 Manufacture of metal products	0.26	25
370 Manufacture of electrical machinery, appliance etc.	0.09	14
384 Repair of motor vehicles and cycles	-0.72**	41

Note : * Significant at 5 per cent level

      ** Significant at 1 per cent level

        Others not significant

the possibility of diversification of manufacturing activities and industrial development of backward areas. We, however, find that when all industries are taken together the hypothesis holds, though weakly.

Let us, therefore, now examine a related hypothesis: industrial units in an industry tend to go to locations where related industries with linkage potential already exist. We have attempted to examine this relationship in the case of four sets of interrelated industries : food products group, textiles, chemicals, and metal based group. The only relationships that turned out significant are the following:

Table III:2
Locational Inter-relationships Among Industries

E 1960 in 209 with $\triangle$E 1960-75 in	206	r = 0.75
231	239	r = 0.99
319	300	r = 0.63
342	370	r = 0.74
384	341	r = 0.96
384	350	r = 0.98
384	370	r = 0.44

The results of the exercise read with those reported
in Table III:2 suggest that expansion of an industry is
more often related with the base of the related industries,
than its own importance in a region. But this relation-
ship is also found operative only in a few cases. To a
certain extent it may be a reflection of the very nature
of industrial structure in the State : dominance of
industries of autonomous type without much forward and
backward linkages. But still, some of the relationship
seem highly meaningful. For example, location of new acti-
vity in the manufacture of miscellaneous textile products
is highly positively associated with the level of activity
in the spinning, weaving and finsihing of textiles in the
base year. Similarly, in the manufacture of electrical
machinery, apparatus, appliances etc., the new activity
has got located in different districts in line with the
base of melting and refining of the nonferrous metals. The
base of repair activities is found very closely related
with the new activity in basic metals and metal products.
In the food products groups, bakery products and miscella-
neous food preparations have gone together; while rubber
products and chemical products have formed another pair of
industries with closely associated locations.

This aspect of locational structure, however, needs to be investigated in greater detail with a view to indentifying a larger number of operational and potential associations and clusters, and the nature of their associations-forward or backward linkages or reliance on some common inputs available in a region. Such identification of clusters and catalytic industries may be of great help in locational planning of industrial activity.

District Characteristics and Location

A detailed analysis of factors in location of specific industries in terms of the variables affecting costs, prices and other-relevant inputs for location decisions, as well as of the locational linkages among industries, is ~~planned to be~~ carried out later/on the basis of the primary data ~~currently being~~ collected from a sample of factories in different industries and districts. A preliminary analysis based on some overall characteristics of different districts is undertaken here as an attempt to explain the spatial distribution of incremental industrial activity. The factors chosen are meant to represent the demand and raw material situation, infrastructure, and

efforts made by public institutions to develop indus-
tries in different districts. Value of agricultural
production per person is assumed to reflect the local
demand for industrial products as well as the raw material
base. Road mileage per 1000 square kilometers of area,
population per bank office, and electricity consumption
are taken to represent the general level of infra-
structure development. Loans and investments made by
promotional and financial institutions such as U.P. State
Industrial Development Corporation (UPSIDC), U.P. Finan-
cial Corporation (UPFC), and Pradeshiya Industrial and Invest-
ment Corporation of Uttar Pradesh (PICUP) are taken as in-
dicators of official efforts to develop industries in
different districts. Multiple regression and partial corre-
lation analysis have been carried out with the above as
independent variable and number of factories and employment
added in all industries together, and additional factory
employment in each of the 12 selected industries in various
districts as the dependent variables. The results of the
analysis are reported in Table III:3.

The results of the regression analysis show an overall
high explanatory power of the model in most of the cases,
and most of the coefficients are also found to be significant.

Table III:3

Results of Regression Analysis

Y	Constant	Coefficients of independent variables					R2
		X_1	X_2	X_3	X_4	X_5	
1	2	3	4	5	6	7	8
1. Factories added during 1960-75 All Industries ($\triangle$F 1960-75)	- 75.37	+ 20.37* (0.598)	+ 0.45* (0.014)	- 0.54* (0.014)	+ 0.17 (0.004)	+ 0.11 (0.019)	0.9814
2. Factory employment added during 1960-75 : All Industries ($\triangle$E 1960-75)	- 596.86	+ 600.77* (104.60)	+ 28.10* (2.51)	- 77.59* (7.15)	+ 6.30* (0.663)	+ 11.94* (3.40)	0.8768
3. $\triangle$E 1960-75 Industry : 207 Sugar	- 7529.06	+1538.61* (10.47)	+ 35.28* (0.244)	+ 6.09* (0.74)	- 3.45* (0.057)	+ 21.10* (0.47)	0.9902
4. $\triangle$E 1960-75 Industry : 209 Misc. food products	- 66.20	+ 77.69* (0.30)	+ 0.32 (0.19)	- 2.40* (0.58)	- 0.12 (0.044)	- 0.57 (0.226)	0.7611
5. $\triangle$E 1960-75 Industry : 231 Textile Weaving Spinning etc.	-10142.40	+1177.45* (109.11)	+ 38.87* (2.26)	+ 59.48* (7.26)	+ 1.12 (0.45)	+ 2.17 (2.33)	0.7885
6. $\triangle$E 1960-75 Industry : 233 Cordage, rope and Twine Industries	1056.40	- 13.91* (2.97)	- 1.86* (0.058)	- 13.91* (0.257)	- 0.03* (0.009)	- 0.06 (0.52)	0.9732
7. $\triangle$E 1960-75 Industry : 300 Rubber and rubber products	256.62	136.03* (0.82)	- 4.39 (0.018)	- 9.81 (0.756)	+ 1.05 (0.003)	+ 0.05 (0.018)	0.9728

Results of Regression Analysis
(contd.)

1	2	3	4	5	6	7	8
8. △E 1960-75 (Industry: 311) Basic Chemicals including fertilizers	1263.96	- 219.08* (27.39)	- 3.59* (0.528)	- 3.43 (2.15)	+ 0.13 (0.105)	+ 0.57 (0.54)	0.6817
9. △E 1960-75 Industry: 319 Misc. Chemical products	- 71.26	+ 55.61* (4.75)	+ 0.378* (0.106)	- 2.301* (0.371)	+0.416* (0.023)	-0.186 (0.118)	0.9383
10. △E 1960-75 Industry: 341 Iron and Steel	-2308.83	+ 381.55* (9.68)	5.30* (0.204)	+14.41* (0.759)	+ 2.32* (0.436)	+0.001 (0.242)	0.9894
11. △E 1960-75 Industry: 342 Non-ferrous metal melting & refining	-2302.42	+ 386.72* (7.03)	+ 3.85* (0.138)	+13.42* (0.492)	- 0.32* (0.024)	+13.00 (0.136)	0.9968
12. △E 1960-75 Industry: 350 Metal products	-1402.53	+ 156.02* (6.99)	+ 2.99* (0.16)	+ 8.22* (0.583)	+ 2.30* (0.030)	+ 0.86* (0.155)	0.9948
13. △E 1960-75 Industry: 370 Electrical Machinery apparatus, appliances, etc.	- 435.26	- 45.36 (34.68)	+ 1.18 (0.709)	+11.53* (2.95)	+ 1.49* (0.130)	+ 0.12 (0.67)	0.9964
14. △E 1960-75 Industry: 384 Repair of motor vehicles and motor cycles	-4131.85	- 531.15* (23.92)	8.13* (0.533)	-29.13* (1.623)	- 2.23* (0.133)	- 2.59* (0.68)	0.9103

Note : X_1 = Value of agricultural production per person 1970-71(Rs.900); X_2 = Road mileage per 100 sq.km. area 1970-71 (K.M.); X_3 Population per commer-cial bank office 1975(1000); X_4 = Loans and investments by financial institutions (UPSIDC, UPFC and PICUP) 1960-75(Rs.lakhs); X_5 = Electricity consumption per head 1970-71(in KW)

* Significant at 90 per cent or higher level of confidence.

It is found that the inter-district variations in the
number of new factories established and employment added
in all industries during 1960-75, are quite well explained
by the macro-characteristics of the districts selected for
analysis. A unit (R.100) variation in value of per capita
agricultural production is found to be associated with 20
units variation in factories and 600 unit variation in
employment. A difference of one kilometer of road per 1000
of population has been accompanied by a variation of 0.45
of factory and 28 persons in employment. The bank office
variable is negatively specified in terms of population
('000) per bank branch and, therefore, its coefficient has
a negative sign; its values are significantly associated
with incremental industrial activity, as reduction by 1000
is associated with the location of half a new factory and
increase in factory employment by 78 persons. A higher
investment by public institutions of R.1 lakh in one district
than in another, brings about a difference of 0.17 of a
factory and 6 workers. Similarly if electricity consumption
changes by 1 KW per person from one district to another, it
is associated with a difference of 0.11 of a factory and
employment of 12 persons.

The value of agricultural production per person is
found to be associated with the addition in factory employ-
ment in the case of most of the selected industries also.
In a few industries ~~example~~ : (cordage, rope and twine
industries; basic chemicals and repair of motor vehicles),
however, the coefficients have a significant and negative
value. No logical explanation could be given for this:
the location of new factories and employment in these
industries may well not be related with the level of
agricultural development, but there is no reason to believe
that it has an inverse causal relation. Similar is the
case of road mileage in the equation for cordage, rope and
twine, basic chemicals; of banking facilities in the equa-
tions for textile weaving, spinning etc., iron and steel,
non-ferrous metals, metal products and electrical machinery;
of institutional finance in case of sugar, cordage, rope
and twine, miscellaneous chemical products, and repair of
motor vehicles and motor cycles, the results are contrary
to expectations, and can only be explained in terms of the
inadequacy of the model. These cases may be investigated
at a later stage on the basis of more specific variables.

Overall, the variations in agricultural development
seem to explain a large part of the inter-district variations

in the location of incremental industrial activity. It
must, however, be kept in mind that the large values of
the coefficients of this variable reflect the unit used
in specification (Rs.'00) and its relatively low variation
as compared to the dependent variable. Transport facili-
ties, represented by road mileage, is again found to have
a strong effect; it is found to be particularly high in
case of sugar, and textile industries and quite low in
miscellaneous food products and miscellaneous chemical
products. Banking facilities are found to have a substan-
tial effect on overall industrial activity, but their
effect is found particularly notable in sugar, cordage,
rope and twine, rubber and rubber products, and repair of
motor vehicles and motor cycles. Institutional financing
seems to have contributed significantly, particularly in
case of basic metals and engineering industries.

It is interesting to note, however, that while the
contribution of each of these variables is quite signifi-
cant in combination with each other, it pales into virtual
insignificance when variables are considered singly. Partial
correlation coefficients, measuring the contribution of
variable keeping the others constant, turn out to be in-
significant in most of the cases (Table III:4). The only

Table III:4

Partial Correlation Coefficients

Y	$YX_1 \cdot X_2,$ X_3, X_4, X_5	$YX_2 \cdot X_1$ X_3, X_4, X_5	$YX_3 \cdot X_1$ X_2, X_4, X_5	$YX_4 \cdot X_1$ X_2, X_3, X_5	$YX_5 \cdot X_1$ X_2, X_3, X_4
	2	3	4	5	6
1. Factories added during 1960-75: All Industries ($\triangle$F1960-75)	+ 0.2572	+ 0.2829	- 0.1610	+ 0.8006*	+ 0.1621
2. Factory Employment added during 1960-75: All Industries ($\triangle$E1960-75)	+ 0.0721	+ 0.1687	- 0.2092	+ 0.4361*	+ 0.1627
3. $\triangle$E1960-75 Industry: 207 Misc- Sugar	+ 0.7040	+ 0.7793	- 0.0820	- 0.8600*	+ 0.6212
4. $\triangle$E1960-75 Industry: 209 Misc. Food products	+ 0.1518	+ 0.0271	- 0.1107	- 0.1633	- 0.1441
5. $\triangle$E1960-75 Industry: 231 Textile weaving, Spinning etc.	+ 0.2317	+ 0.3195	+ 0.2741	+ 0.1861	+ 0.0611
6. $\triangle$E1960-75 Industry: 233 Cordage, rope and Twine Industries	- 0.5217	- 0.2788	- 0.5508	- 0.1447	- 0.1884
7. $\triangle$E1960-75 Industry: 300 Rubber and Rubber products	+ 0.5485	- 0.6984	- 0.5377	+ 0.9814*	+ 0.0488

Partial Correlation

1	2	3	4	5	6
8. △E1960-75 Industry : 311 Basic chemicals including fertilizers	- 0.2227	- 0.1645	- 0.0614	+ 0.1193	0.0858
9. △E1960-75 Industry : 319 Misc. Chemical products	+ 0.1978	+ 0.0632	- 0.1751	+ 0.7226*	- 0.0819
10. △E1960-75 Industry : 341 Iron and steel	+ 0.3994	+ 0.2498	+ 0.2860	+ 0.8832*	+ 0.0368
11. △E1960-75 Industry : 342 Non-ferrous metal melting and refining	+ 0.5281	+ 0.2419	+ 0.3926	- 0.3799	+ 0.9402*
12. △E1960-75 Industry : 350 Metal products	+ 0.2106	+ 0.1615	+ 0.1677	+ 0.9205*	+ 0.1471
13. △E1960-75 Industry : 370 Electrical Machinery Apparatus, appliances etc.	- 0.0326	+ 0.0334	+ 0.1233	+ 0.6509*	+ 0.0120
14. △E1960-75 Industry : 384 Repair of Motor vehicles and motor cycles	- 0.3015	- 0.2154	- 0.3575	- 0.6556*	- 0.1718

Note : X_1= Value of agricultural production per person 1970-71(Rs.900); X_2= Road mileage per 1000 sq.KM area (1970-71(K.M.); X_3= Population per commercial bank office 1977-78 (1000); X_4= Loans and investments by financial institutions(UPSIDC, UPFC and PICUP) upto 1975(Rs. lakhs); X_5= Electricity consumption per head 1970-71(in KW).

* Significant at 90 per cent or higher level of confidence.

variable which gives significant partial correlation
coefficient, at least in some cases, is the institutional
finance. In case of overall distribution both of added
factories and employment, the loans and investments made
by State level institutions explain a significant extent
of inter-district variations, even when the influence of
other variables is ignored. Similar tendency is found to
prevail in case of some individual industry groups : rubber
and rubber products, basic metals (iron and steel), metal
products, chemical products and electrical machinery.

The broad conclusion that emerges from the foregoing
analysis is that the macro-variables relating to levels of
agricultural development, infrastructure and special efforts
made by public institutions, by and large, explain the
inter-district variations in location of economic activity
significantly. It, however, looks that their influence is
much better felt if applied in combination. Special pro-
motional and financial efforts by public institutions, how-
ever, seem to make their results felt to a certain extent,
irrespective of other macro-characteristics of the districts,
particularly in case of modern foot-loose industry, not
based on specific local raw material.

Chapter IV
FACTORS IN LOCATION : ENTREPRENEURS' PERCEPTION

In the previous chapter we looked into some of the important characteristics of districts that tend to favour location of industries. In the present chapter we make an attempt to assess how the individual entrepreneurs' perceive the importance of various factors considered to be relevant for deciding the location of their units. This assessment is undertaken on the basis of responses from the entrepreneurs of 293 factories selected on a sample basis as described in chapter I. Before analysing the entrepreneurs' responses, it would, however, be useful to briefly describe the structure of the selected factories and some characteristics of their enterpreneurs.

The Structure of Sampled Factories

The distribution of sampled factories by industry group and district is given in Table IV:1. The sample has been constrained by several considerations as outlined earlier, and therefore, may not be exactly representative of the product group and spatial structure of industries

Table IV – 1

Districtwise and Industrywise Distribution of Sample Units

Code	Products	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharan-pur	Dehra Dun	Moradabad	Muzzaffer nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Total
205.3	Bakery and Milk Products	3	9	–	–	–	–	–	1	–	1	–	1	3	–	–	1	–	–	1	2	–	–	22
211.0	Oil and Grain Mill Products	2	3	3	–	–	1	–	1	–	2	–	3	3	–	–	2	–	–	–	–	2	3	25
280.5	Straw Board and Mill Board	1	1	–	–	1	–	1	3	–	–	1	2	–	–	–	–	–	–	–	–	2	–	12
300.3	Cycle Tyre and Tubes	2	1	–	1	3	–	1	2	–	–	2	–	–	–	–	–	–	–	–	–	–	–	11
310.1	Basic Industrial Chemicals	1	8	–	–	–	1	–	–	–	–	–	–	2	–	–	–	–	1	–	–	–	–	13
321.1	Glass Products	–	–	4	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	7
323.1	China Wares	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	17	–	–	1	–	–	16
329.1	Cement and Hume Pipes	3	–	–	1	1	1	–	1	–	3	2	2	1	1	2	1	–	2	1	1	1	–	12
331.1	Casting and Forging	2	3	11	2	15	2	1	2	–	3	2	2	2	1	1	1	–	2	1	1	1	–	54
331.3	Steel Pipes	–	5	1	–	3	–	–	3	–	–	–	–	–	–	1	–	–	–	–	–	2	–	15
340.3	Nuts and Bolts and Metal Containers	–	8	4	1	4	1	–	1	–	1	1	4	1	–	–	–	–	–	–	–	–	1	24
343.5	Agricultural Hand Tools and Implements	–	–	–	2	–	–	–	–	–	2	–	–	–	–	–	2	–	–	–	–	1	–	7
345.2	Metal Utensils	3	8	3	–	2	2	2	1	–	7	1	1	–	3	–	–	–	–	1	3	–	–	37
350.2	Manufacture of Light Agricultural Machinery and Equipment	3	1	–	–	4	–	–	1	–	1	1	3	–	–	–	–	–	–	–	–	–	1	14
973.0	Repair of Motor Vehicles	1	4	3	–	–	–	–	1	2	1	–	2	–	–	–	4	–	–	–	3	1	–	21
	Total	20	51	30	6	36	8	4	16	2	16	7	18	12	4	3	10	17	5	3	10	9	5	292

in the State. But by and large, the number of
factories selected in each district and industry group
are found to follow the pattern of their relative importance.
The characteristics of the sample as described below
are also not found to significantly vary from those of
the industrial structure of the State as a whole.

There has been a rapid growth of the number of
factories in the State during the last two decades, over
50 per cent of the working factories in 1975 were reported
to have been established during the previous 15 years.
In our sample taken out of the list for 1977, we have
around 60 per cent factories less than 15 years' old, and
only 12 per cent aged 25 years or more. The proportion
of new units is significant among units in cycle tube and
tyres, china-ware, cement and hume pipes, casting and
forging, nuts and bolts, and metal utensils. The sampled
factories are dominated by the young ones in Ghaziabad,
Lucknow, Bulandshahr, Gorakhpur and Sitapur, and by old
ones in Kanpur, Saharanpur, Moradabad, Aligarh, Allahabad
and Unnao. On an average, a sampled factory is about 14
years old, but those in glass products, basic industrial
chemicals are relatively older at around 20 years and those

in cycle tyres and tubes are the youngest at an average
of 7 years, the next youngest being those in china-ware
(10.16 years) and cement and hume pipes (11.67 years).
Units in Mathura reveal the highest average age at 20
years followed by Mirzapur at 19.50 years; and those in
Lucknow are the youngest at 7 years followed by Meerut,
Ghaziabad and Bulandshahr at around 9.70 years.

Small units are found to dominate the size-structure
of factories in the sample : 49 per cent of them have an
employment size of 10 to 20 workers and another 39 per
cent of 20-50 workers (Table IV:2(a) and IV:2(b)). This
pattern is found in almost all the selected industries
and districts except that units manufacturing metal products,
particularly nuts, bolts and metal containers, and metal
utensils have a larger proportion of factories employing
20-50 workers. Among districts, Agra, Lucknow and Moradabad
depart from the general size pattern to the extent that
most of the factories in these districts have an employment
size of 20-50 workers each. Only 7 per cent of the factories
have an employment size of 50-100 workers and only 5 per
cent of more than 100 workers. These relatively large
sized factories are found concentrated mostly in the follow-
ing product groups : casting and forging, cycle tyres and
tubes, glass products, nuts bolts and metal containers and

Table IV – 2(a)

Distribution of Sample Units (Industrywise) by Employment Size

Code	Products	10-20	20-50	50-100	100-250	250+	Total
205.3	Bakery & Milk products	15	5	1	–	1	22
211.0	Oil and Grain Mill Products	11	12	2	–	–	25
280.5	Straw Board and Mill Board	7	4	–	1	–	12
300.3	Cycle Tyre & Tubes	3	4	2	1	1	11
310.1	Basic Industrial Chemicals	5	5	1	1	1	13
321.1	Glass Products	3	1	–	2	1	7
323.1	China-ware	12	4	1	1	–	18
329.1	Cement and Hume Pipe	7	3	2	–	–	12
331.1	Casting and Forging	23	22	7	2	–	54
331.3	Steel Pipes	8	5	2	–	–	15
340.3	Nuts and Bolts and Metal Containers	7	12	2	2	1	24
343.5	Agricultural Hand Tools & Implements	5	2	–	–	–	7
345.2	Metal Utensils	13	24	–	–	–	37
350.2	Manufacture of Light Agricultural Machinery andEquipment	8	6	–	–	–	14
973.0	Repair of Motor Vehicles	16	5	–	–	–	21
	TOTAL	143	114	20	10	5	292

Table IV - 2(b)

Distribution of Sample Units (District-wise) by Employment Size

	District	10-20	20-50	50-100	100-250	250+	Total
1.	Varanasi	11	7	2	-	-	20
2.	Kanpur	23	21	4	1	2	51
3.	Agra	8	17	2	2	1	30
4.	Meerut	4	1	-	-	1	6
5.	Ghaziabad	13	11	7	4	1	36
6.	Lucknow	3	5	-	-	-	8
7.	Bijnor	2	2	-	-	-	4
8.	Saharanpur	10	5	-	1	-	16
9.	Dehradun	1	1	-	-	-	2
10	Moradabad	7	9	-	-	-	16
11	Muzaffarnagar	5	2	-	-	-	7
12	Aligarh	13	5	-	-	-	18
13	Allahabad	6	2	2	2	-	12
14	Mirzapur	1	3	-	-	-	4
15	Nainital	1	2	-	-	-	3
16	Bareilly	6	4	-	-	-	10
17	Bulandshahr	12	4	1	-	-	17
18	Mathura	2	2	1	-	-	5
19	Jaunpur	1	2	-	-	-	3
20	Gorakhpur	7	3	-	-	-	10
21	Unnao	6	3	-	-	-	9
22	Sitapur	1	3	1	-	-	5
	TOTAL	143	114	20	10	5	292

basic industrial chemicals. Most of them are located
in Ghaziabad, Kanpur, Agra and Allahabad.

Despite similarity in the size group distribution
of factories among industries and districts, the average
employment size of factories shows wide variations
(Table IV:3). Average employment size varies from 17
workers in repair of motor vehicles to 105 in glass
products, among product groups; and from 14 workers in
Dehradun to 67 workers in Ghaziabad, among districts. The
'largest' average employment size (of 270 workers) is
recorded by cycle tube and tyre units in Meerut and nuts
and bolts units in Ghaziabad. Within the same product
groups, different districts show widely varying employment
size, bakery and milk product units have an average
employment size of 10 in Saharanpur and of 72 workers in
Kanpur; each of the straw board and mill board units in
Bijnor employ an average of 11 workers, while these in
Saharanpur 103 workers; cycle tubes and tyre units
tend to have a relatively larger size, yet it varies between
30 workers in Varanasi to 268 in Meerut. Similary bolts and
nuts units tend to have relatively larger average size and
also large variations among districts. The product groups
which more or less uniformly have small sizes across the

Table IV - 3

Distribution of Units Districtwise and Industrywise by Average Size of Employment

Code	Products	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur
205.3	Bakery and Milk Products	13.66	71.66	-	-	-	-	-	10.00
211.0	Oil and Grain Mill Products	14.50	50.00	55.00	-	-	11.00	-	18.00
280.5	Straw Board and Mill Board	17.00	50.00	-	-	15.00	-	11.00	103.33
300.3	Cycle Tyre and Tubes	29.50	71.00	-	268.00	68.00	-	-	50.50
310.1	Basic Industrial Chemicals	90.00	99.62	-	-	59.66	-	-	-
321.1	Glass Products	-	-	125.75	-	-	45.00	-	-
323.1	Chine Wares	-	-	110.00	-	-	-	-	-
329.1	Cement and Hume Pipes	20.00	-	-	16.00	12.00	17.00	-	-
331.1	Casting and Forging	51.50	26.00	29.00	28.00	48.42	53.50	10.00	23.50
331.3	Steel Pipes	-	16.80	44.00	-	55.33	-	-	12.33
340.3	Nuts and Bolts and Metal Containers	-	43.75	27.50	-	269.25	20.00	-	33.00
343.5	Agricultural Hand Tools and Implements	-	-	-	14.00	-	-	-	-
345.2	Metal Utensils	29.33	29.37	37.00	-	14.50	28.00	24.00	14.00
350.2	Manufacture of Light Agricultural Machinery and Equipment	52.33	19.00	-	-	17.25	-	-	12.00
973.0	Repair of Motor Vehicles	-	14.25	29.66	-	-	-	-	10.00
	Average of Districts	29.20	48.15	46.37	61.33	67.36	27.00	17.25	34.63

Table IV - 3 (contd.)

Code	Products	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Industry Average
205.3	Bakery and Milk Products	26.00	-	-	14.00	15.00	-	-	38.31
211.0	Oil and Grain Mill Products	21.00	-	-	-	-	22.50	32.33	25.32
280.5	Straw Board and Mill Board	-	-	-	-	-	14.00	-	40.50
300.3	Cycle Tyre and Tubes	-	-	-	-	-	-	-	67.72
310.1	Basic Industrial Chemicals	-	-	16.00	-	-	-	-	83.23
321.1	Glass Products	-	-	-	-	-	-	-	104.57
323.1	China Wares	-	19.18	-	-	-	-	-	24.22
329.1	Cement and Hume Pipes	-	-	47.50	-	11.00	-	-	26.08
331.1	Casting and Forging	15.00	-	20.50	42.00	34.00	15.00	-	33.62
331.3	Steel Pipes	-	-	-	-	-	22.50	-	26.80
340.3	Nuts and Bolts and Metal Containers	-	-	-	-	-	-	22.00	73.04
343.5	Agricultural Hand Tools and Implements	10.5	-	-	-	-	31.00	-	16.85
345.2	Metal Utensils	-	-	-	24.00	33.66	-	-	26.37
350.2	Manufacture of Light Agricultural Machinery and Equipment	-	-	-	-	-	21.00	21.00	22.00
973.0	Repair of Motor Vehicles	19.50	-	-	-	11.66	18.00	-	16.76
	Average of Districts	18.20	19.18	30.40	26.67	21.10	20.22	28.00	37.55

Table IV - 3 (contd.)

Code	Products	Dehra Dun	Moradabad	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital
205.3	Bakery and Milk Products	-	14.00	-	18.00	13.66	-	-
211.0	Oil and Grain Mill Products	-	19.00	-	22.00	30.66	-	-
280.5	Straw Board and Mill Board	-	-	39.00	18.00	-	-	-
300.3	Cycle Tyre and Tubes	-	-	51.00	-	-	-	-
310.1	Basic Industrial Chemicals	-	-	-	-	-	-	-
321.1	Glass Products	-	-	-	-	97.00	-	-
323.1	China Wares	-	-	-	-	57.00	-	22.50
329.1	Cement and Hume Pipes	-	-	-	-	60.00	30.00	-
331.1	Casting and Forging	-	22.33	13.50	17.50	-	-	24.00
331.3	Steel Pipes	-	-	-	-	-	-	-
340.3	Nuts and Bolts and Metal Containers	-	-	-	19.25	84.00	-	-
343.5	Agricultural Hand Tools and Implements	-	19.00	-	-	-	-	-
345.2	Metal Utensils	-	27.00	15.00	10.00	-	21.33	-
350.2	Manufacture of Light Agri-cultural Machinery and Equipment	-	-	10.00	26.66	-	-	-
973.0	Repair of Motor Vehicles	15.50	17.00	-	12.00	-	-	-
	Average of Districts	15.50	22.69	21.86	19.22	48.17	23.50	23.00

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districts are : repair of motor vehicles, light
agricultural machinery and equipment, agricultural hand
tools and implements, metal utensils and casting and
forging.

In terms of size of output the sampled factories
were relatively evenly distributed among the various sized
group ranging from Rs.1 lakh to Rs.50 lakhs; a few units
(5 per cent) had an output size below Rs.1 lakh and
similar number above Rs.50 lakhs in the reference year
(i.e. 1978). Yet industry groups, bakery and milk
products, china-ware, agricultural hand tools and repair
of motor vehicles had most of the units with an output
of less Rs.5 lakhs, and most of units in oil and grain
products, straw board, casting and forging, steel pipes
and nuts, bolts and metal containers produced output
worth over Rs.5 lakhs (Table IV : 4(a)). Among districts,
Bijnor, Saharanpur, Dehradun, Bareilly, Bulandshahr,
Jaunpur and Gorakhpur had units mostly with smaller out-
put each; and a sizeable proportion of units in Varanasi,
Agra, Kanpur, Ghaziabad and Allahabad produced goods
worth over Rs.20 lakhs each (Table IV : 4(b)).

Table IV - 4(a)

Industrywise Distribution by Size of Output

Code	Products	Output (Rs.)						
		Less than 1 lakh	1-2.5 Lakhs	2.5-5 Lakhs	5-10 Lakhs	10-20 lakhs	20-50 Lakhs	50+	Total
205.3	Bakery & Milk Products	1	8	6	1	2	3	1	22
211.0	Oil and Grain Mill Products	-	1	4	4	8	4	4	25
280.5	Straw Board & Mill Board	1	4	1	3	1	2	-	12
300.3	Cycle Tyre and Tubes	-	-	3	-	2	4	2	11
310.1	Basic Industrial Chemicals	1	1	3	1	4	2	1	13
321.1	Glass Products	-	2	1	1	2	1	-	7
323.1	China wares	2	14	-	1	1	-	-	18
329.1	Cement and Hume Pipes	2	2	2	1	3	2	-	12
331.1	Casting and Forging	3	~~7~~	8	14	14	6	2	~~55~~ 54
331.3	Steel Pipes	-	3	2	5	2	2	1	15
340.5	Nuts and Bolts and Metal Containers	-	2	3	3	7	6	3	24
343.5	Agricultural Hand Tools and Implements	1	2	2	1	1	-	-	7
345.2	Metal Utensils	1	4	10	10	9	3	-	37
350.2	Manufacture of Light Agricultural Machinery and Equipment	1	2	4	4	3	-	-	14
973.0	Repair of Motor Vehicles	2	5	10	2	2	-	-	21
	Total	15	~~56~~ 57	59	51	61	35	14	~~294~~ 292

Table IV - 4(b)

Districtwise Distribution by Size of Output

Districts	Less than 1 lakh	1-2.5 lakhs	2.5-5 lakhs	5-10 lakhs	10-20 lakhs	20-50 lakhs	50 +	Total
1. Varanasi	-	4	7	4	3	2	-	20
2. Kanpur	1	8	7	11	11	8	5	51
3. Agra	-	3	6	2	13	6	-	30
4. Meerut	1	1	1	2	-	-	1	6
5. Ghaziabad	4	2	1	9	9	6	5	36
6. Lucknow	-	1	2	4	-	1	-	8
7. Bijnor	-	2	1	-	1	-	-	4
8. Saharanpur	-	4	5	3	3	1	-	16
9. Dehradun	-	2	-	-	-	-	-	2
10. Moradabad	1	4	3	1	5	2	-	16
11. Muzaffarnagar	-	3	1	1	1	1	-	7
12. Aligarh	-	3	6	4	2	3	-	18
13. Allahabad	2	1	1	2	3	2	1	12
14. Mirzapur	1	-	1	1	-	1	-	4
15. Nainital	-	-	1	1	1	-	-	3
16. Bareilly	-	1	7	1	1	-	-	10
17. Bulandshahr	2	14	-	1	-	-	-	17
18. Mathura	-	-	1	1	1	2	-	5
19. Jaunpur	-	1	2	-	-	-	-	3
20. Gorakhpur	2	-	4	1	3	-	-	10
21. Unnao	1	2	2	2	2	-	-	9
22. Sitapur	-	-	1	-	2	-	2	5
TOTAL	15	56	60	51	61	35	14	292

Average output per factory, however, varied widely:
(Table IV - 5) among product groups pottery and chinaware
units had the lowest average output of Rs.2.74 lakhs,
while the highest average of Rs.39.66 lakhs was found
among units producing nuts, bolts and metal containers.
Units producing straw board, chinaware, agricultural hand
tools, metal utensils, light agricultural machinery and
equipment and repair of motor vehicles showed an average
output of less than Rs.10 lakhs; and those producing cycle
tyres and tubes, oil and grain mill products, and nuts
and bolts, of over Rs.30 lakhs each. Among districts
lowest average output was recorded by units in Bulandshahr,
(Rs.1.63 lakhs) and the highest by Sitapur at Rs.43 lakhs.
Units in Bijnor, Dehradun, Bulandshahr, and Jaunpur recorded
an average output of less than Rs.5 lakhs, while there in
Kanpur, Meerut, Gaziabad and Sitapur of over Rs.20 lakhs each.

Generally the average output size is found to vary
across industries and districts in line with the average
employment size. (The coefficient of rank corelation bet-
ween average size of output and average size of employment
in units computes to 0.685 for districts and 0.487 for
industries). In a few cases, however, the two variables are

Table IV - 5

Distribution of Units Districtwise and Industrywise by Average Size of Output

Average Output (Rs. Lakhs)

Code	Product	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	DehraDun
205.3	Bakery and Milk Products	2.05	-	40.01	-	-	-	-	-	1.86
211.0	Oil and Grain Mill Products	11.64	74.03	18.15	-	-	77.98	-	-	4.11
280.5	Straw Board and Mill Board	42.20	7.15	-	-	8.53	-	1.84	-	17.42
300.3	Cycle Tyre and Tubes	11.63	29.38	-	196.24	33.09	-	-	-	10.93
310.1	Basic Industrial Chemicals	37.11	32.03	-	-	6.93	-	-	-	-
321.1	Glass Products	-	-	14.44	-	-	5.11	-	-	-
323.1	China Wares	-	-	12.71	-	-	-	-	-	-
329.1	Cement and Hume Pipes	7.64	-	-	5.39	0.57	2.27	-	-	-
331.1	Casting and Forging	3.20	5.20	13.30	3.69	24.69	17.05	1.84	-	8.61
331.3	Steel Pipes	-	7.28	38.96	-	42.69	-	-	-	2.72
340.3	Nuts and Bolts and Metal Containers	-	33.82	8.47	-	146.04	9.00	-	-	17.59
343.5	Agricultural Hand Tools and Implements	-	-	-	0.98	-	-	-	-	-
345.2	Metal Utensils	5.53	6.16	18.14	-	5.81	4.21	7.82	-	7.19
350.2	Manufacture of Light Agricultural Machinery and Equipment	7.67	5.51	-	-	5.14	-	-	3.99	-
973.0	Repair of Motor Vehicles	-	2.87	7.55	-	-	-	-	2.38	1.89
	District Average	10.05	25.28	14.04	35.25	34.55	17.11	4.83	8.54	1.89
	Output per worker	2.91	1.90	3.30	1.74	1.95	1.58	3.57	4.06	7.14

Table IV - 5 (contd.)

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Code	Product	Moradabad	Muzzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Bulandshahr
205.3	Bakery and Milk Products	1.25	-	4.91	3.97	-	-	2.86	-
211.0	Oil and Grain Mill Products	18.82	-	14.82	19.69	-	-	7.55	-
280.5	Straw Board and Mill Board	-	12.52	19.09	-	-	-	-	-
300.3	Cycle Tyre and Tubes	-	12.62	-	-	-	-	-	-
310.1	Basic Industrial Chemicals	-	-	-	-	-	-	-	-
321.1	Glass Products	-	-	-	6.58	-	-	-	-
323.1	China Wares	-	-	-	-	-	-	-	1.63
329.1	Cement and Hume Pipes	-	-	-	10.00	-	7.54	-	-
331.1	Casting and Forging	5.34	3.54	5.80	11.76	0.90	-	6.57	-
331.3	Steel Pipes	-	-	-	-	-	9.06	-	-
340.3	Nuts and Bolts and Metal Containers	-	-	7.63	7.27	-	-	-	-
343.5	Agricultural Hand Tools and Implements	3.96	-	-	-	-	-	1.62	-
345.2	Metal Utensils	12.48	2.37	4.93	-	18.00	-	-	-
350.2	Manufacture of Light Agricultural Machinery and Equipment	-	1.76	7.64	-	-	-	-	-
973.0	Repair of Motor Vehicles	3.67	-	2.41	-	-	-	3.62	-
	District Average	9.62	7.00	9.02	10.41	13.73	8.05	4.23	1.63
	Output per worker	2.36	3.11	2.13	4.63	1.71	2.86	4.30	11.7

Table IV - 5 (contd.)

Code	Product	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Industry Average	Output per Worker
205.3	Bakery and Milk Products	-	1.20	3.13	-	-	18.02	2.13
211.0	Oil and Grain Mill Products	-	-	-	9.60	65.84	30.20	0.84
280.5	Straw Board and Mill Board	-	-	-	1.21	-	9.96	4.07
300.3	Cycle Tyre and Tubes	-	-	-	-	-	35.98	1.89
310.1	Basic Industrial Chemicals	4.00	-	-	-	-	22.91	3.63
321.1	Glass Products	-	-	-	-	-	10.86	9.63
323.1	China Wares	-	-	-	-	-	2.74	8.84
329.1	Cement and Hume Pipes	34.51	-	0.86	-	-	10.51	2.48
331.1	Casting and Forging	8.94	4.25	3.07	10.29	-	20.49	1.64
331.3	Steel Pipes	-	-	-	5.92	-	15.39	1.74
340.3	Nuts and Bolts and Metal Containers	-	-	-	-	13.50	39.66	1.84
343.5	Agricultural Hand Tools and Implements	-	-	-	5.21	-	4.37	3.85
345.2	Metal Utensils	-	4.17	11.55	-	-	9.46	2.79
350.2	Manufacture of Light Agricultural Machinery and Equipment	-	-	-	-	3.96	5.88	3.74
973.0	Repair of Motor Vehicles	-	-	6.79	0.84	-	4.03	4.16
	District Average	18.18	3.21	6.52	5.53	43.00	16.18	2.32
	Output per worker	1.67	8.31	3.24	3.66	0.65		

found to move differently. Oil and gain mills have a
relatively large output but very low employment per unit.
On the other hand, glass products and chinaware units show
very high employment size in relation to their output
size. Among districts, Sitapur records a high output size
as compared to employment size per unit and Dehradun,
Bulandshahr, Jaunpur large employment average as compared
to output average. For the sample as a whole output worth
Rs.1 lakh in accompanied by employment of 2.32 workers, in
oil and grain mills the figure is only 0.84 workers, in
glass products 9.63 and in chinaware 8.84 workers. Sitapur
district shows a figure of 0.65, Dehradun 7.14, Bulandshahr
11.77 and Jaunpur 8.31 workers.

Accordingly, wide variations are found in productivity
measured in terms of output per worker ~~and value added per~~
~~worker~~ in the factory sector across the districts. Against
an average of Rs.42,852 as value of output per worker for the
entire sample, Bulandshahr units have as low a figure as
Rs.8,510, Jaunpur, Rs.12,041, and Dehradun Rs.14,017. It
must, however, be noted that Bulandshahr sample is dominated
by China-ware units, and Dehradun by repair units which show
low productivity elsewhere as well. But Jaunpur units have

significantly lower than average productivity in each
of the industry in the sample. The highest value of
output per worker is shown by the sampled units in
Sitapur (Rs.153565), followed by Mirzapur (Rs.67104) and
Meerut (Rs.54968). The sample for Sitapur is dominated
by oil and grain mills, which in any case show a high
productivity in most districts, but Sitapur units in
this industry generate much higher than average value of
output _per_ worker. High productivity of Mirzapur units
is not on account of its structure of sample units, as
the major sampled industry in that district, metal utensils,
is not one with very high productivity in general; but
units in this industry in Mirzapur have very high producti-
vity as compared to these in other districts. Meerut units
show lower than average productivity in most industries,
but since the structure of sample units in that district
has been weighed heavily in favour of cycle tyres and
tubes which _have_ generally high productivity, the district
comes up as a high productivity one.

Entrepreneurs

Most of the units have partnership as their form of
organisation : 76 per cent of them are in this category.

Another 13 per cent are operated as individual proprietry concerns. 10 per cent are private limited companies and 2 per cent public limited companies. No wonder, therefore, that most of the units have their entrepreneurs working with them. Only less than five per cent of entrepreneurs are absentee owners, rest are working in the units they have promoted, 79 per cent as working partners or managing directors, 18 per cent as managers and rest in some other capacities. Absentee entrepreneurs are found to a significant measure in the units in basic industrial chemicals, and steel pipes, and in Kanpur and Ghaziabad districts. This mainly reflects the relatively large size and public limited form of organisation.

An average entrepreneur is aged 43 years in fact, the average age of entrepreneurs falls between 41 and 45 years in most industries. In glass products units however, an entrepreneur is 34 years old and in agricultural hand tools and equipment 38 years old. Those in basic industrial chemical units are the oldest with an average age nearing 50 years, followed by oil and grain mill owners at 48 years and entrepreneurs of casting and forging units at an average of 46 years. Those below 35 years of age constitute around 17 per cent and those above 50 years 21 per cent of the entrepreneurs.

All but 3 per cent of entrepreneurs are literate:
91 per cent are at least matriculates, 48 per cent gradua-
tes, and 12 per cent hold technical qualifications: 7 per
cent of a degrees and 5 per cent of a diploma level. Units
manufacturing cycle tube and tyre, basic industrial chemi-
cals, steel pipes and manufacture of light agricultural
machinery and equipment, have the most educated entrepre-
neurs: in each of these lines more than half of entrepreneurs
are graduates. Those with technical qualifications are
mostly found in the product groups casting and forging, cycle
tyres and tubes, basic industrial chemicals, and repair of
motor vehicles. Among districts Ghaziabad, Kanpur, Meerut,
Lucknow and Bulandshahr have over half of the entrepreneurs
as graduates; and Kanpur, Ghaziabad, Lucknow and Unnao had a
significant proportion of their entrepreneurs with technical
qualifications.

The entrepreneurs were predominantly of local origin:
over two-thirds of the entrepreneurs belonged to the same
district in which their factory was located (Table IV - 6).
This proportion of local to non-local entrepreneurs was
observed in all industries except in basic industrial che-
micals, where majority of the entrepreneurs were non-local

TABLE IV : 6 (a)
Industrywise distribution of Units by Domicile Status of Entrepreneurs

Code	Products	Local	Non-Local	Total	Rural	Urban	Total
205.3	Bakery & Milk Products	15	7	22	2	20	22
211.0	Oil and Grain Mill Products	19	6	25	4	21	25
230.5	Straw Board and Mill Board	8	4	12	1	11	12
300.3	Cycle Tyre and Tubes	7	4	11	1	10	11
310.1	Basic Industrial Chemicals	7	6	13	2	11	13
321.1	Glass Products	6	1	7	2	5	7
323.1	China Wares	16	2	18	5	13	18
329.1	Cement and Hume Pipes	7	5	12	2	10	12
331.1	Casting and Forging	35	19	54	12	42	54
331.3	Steel Pipes	9	6	15	2	13	15
340.3	Nuts and Bolts and Metal Containers	14	10	24	6	18	24
343.5	Agricultural Hand Tools and Implements	6	1	7	1	6	7
345.2	Metal Utensils	28	9	37	6	31	37
350.2	Manufacture of Light Agricultural Machinery and Equipment	10	4	14	1	13	14
973.0	Repair of Motor Vehicles	15	6	21	-	21	21
	TOTAL	200	92	291	47	245	291

TABLE IV-16 (b)

Districtwise distribution of Units by Domicile status of Entrepreneurs

	Districts	Local	Non-Local	Total	Rural	Urban	Total
1.	Varanasi	15	5	20	2	18	20
2.	Kanpur	30	21	51	10	41	51
3.	Agra	24	6	30	6	24	30
4.	Meerut	6	-	6	-	6	6
5.	Ghaziabad	12	24	36	7	29	36
6.	Lucknow	7	1	8	1	7	8
7.	Bijnor	4	-	4	1	3	4
8.	Saharanpur	12	4	16	1	15	16
9.	Dehradun	1	1	2	-	2	2
10.	Moradabad	11	5	16	2	14	16
11.	Muzaffarnagar	6	1	7	1	6	7
12.	Aligarh	16	2	18	2	16	18
13.	Allahabad	10	2	12	1	11	12
14.	Mirzapur	4	-	4	-	4	4
15.	Nainital	3	-	3	2	1	3
16.	Bareilly	5	5	10	2	8	10
17.	Bulandshahr	15	2	17	5	12	17
18.	Mathura	4	1	5	-	5	5
19.	Jaunpur	3	-	3	-	3	3
20.	Gorakhpur	6	4	10	-	10	10
21.	Unnao	5	4	9	1	8	9
22.	Sitapur	1	4	5	3	2	5
	TOTAL	200	91	291	47	245	291

and in agricultural hand tools and implements where
four-fifths were locals. Among districts, in Ghaziabad
two-thirds of the entrepreneurs were of non-local origin
but in Lucknow, Bijnor, Muzaffarnagar, Agra, Aligarh,
Allahabad, Mirzapur, Nainital, Bulandshahr, Mathura and
Jaunpur over 80 per cent of them were of local origin.

Urban areas provided the main source of entrepreneurs
in all industries : 84 per cent of all entrepreneurs
belonged to towns and cities (Table IV - 6). The only
industries in which entrepreneurs originating from rural
areas form at least 20 per cent are glass products, china-
ware, casting and forging, and nuts, bolts and metal
containers. Repair of motor vehicles have all its entre-
preneurs from urban areas. Among districts Kanpur, Agra,
Ghaziabad, Nainital, Bareilly, and Sitapur have at least
20 per cent of their entrepreneurs with rural origin.
Business and Trading is the main occupation supplying entre-
preneurs to the factories (Table IV - 7): 85 per cent of
the entrepreneur had business and trading as their family
occupation. Those with agricultural background constitute
only 5 per cent and have mainly gone into china-ware and
cement and hume pipe manufacture. The entrepreneurs with

TABLE No. IV : 7 (a)

Industrywise distribution of Units by Family Occupation of Entrepreneurs

Products	Agri-cul-ture	Busi-ness/tra-ding	Service	No In-forma-tion	TOTAL
Bakery & Milk Products	1	21	-	-	22
Oil and Grain Mill products	-	23	-	2	25
Straw Board and Mill Board	-	11	1	-	12
Cycle Tyre and Tubes	1	9	1	-	11
Basic Industrial Chemicals	-	6	2	5	13
Glass Products	1	6	-	-	7
China Wares	3	11	2	2	18
Cement and Hume Pipes	2	9	1	-	12
Casting and Forging	2	46	5	1	54
Steel Pipes	1	14	-	-	15
Nuts and Bolts and Metal Containers	2	21	1	-	24
Agricultural Hand Tools and Implements	-	6	1	-	7
Metal Utensils	1	34	1	1	37
Manufacture of Light Agri-cultural Machinery and Equipments	-	13	1	-	14
Repair of Motor Vehicles	1	16	4	-	21
TOTAL	15	246	20	11	292

TABLE IV : 7(b)

Districtwise distribution of Units by Family Occupation of Entrepreneurs.

Districts	Agricul-ture	Business/trading	Ser-vice	No In-formation	TOTAL
1. Varanasi	-	19	-	1	20
2. Kanpur	2	40	1	8	51
3. Agra	2	25	3	-	30
4. Meerut	-	5	1	-	6
5. Ghaziabad	-	30	6	-	36
6. Lucknow	1	6	1	-	8
7. Bijnor	-	4	-	-	4
8. Saharanpur	-	16	-	-	16
9. Dehradun	-	2	-	-	2
10. Moradabad	-	14	2	-	16
11. Muzaffarnagar	1	6	-	-	7
12. Aligarh	1	16	1	-	18
13. Allahabad	-	12	-	-	12
14. Mirzapur	-	4	-	-	4
15. Nainital	2	1	-	-	3
16. Bareilly	3	5	2	-	10
17. Bulandshahr	3	10	2	2	17
18. Mathura	-	5	-	-	5
19. Jaunpur	-	3	-	-	3
20. Gorakhpur	-	10	-	-	10
21. Unnao	-	8	1	-	9
22. Sitapur	-	5	-	-	5
TOTAL	15	246	20	11	292

agricultural background are found to make a significant proportion of the total in the Nainital, Bareilly and Bulandshahr.

Almost half (49 per cent) of the entrepreneurs had some previous working experience before they launched the present venture, two-thirds of them in the same line of business as they are engaged in now. Those with experience dominated the sample in oil and grain mill products, glass products and casting and forging. In most of these cases, the entrepreneur's previous experience was in the present line of activity but in basic industrial chemicals, nuts bolts and metal containers, light agricultural machinery and equipment and straw board and mill board units the previous experience of the entrepreneurs was mostly in other than the present line of activity. Most of the entre- preneurs in cement and hume pipes, steel pipes, nuts, bolts and metal containers, agricultural hand tools, metal uten- sils, light agricultural machinery and equipment and repair of motor vehicles reported no previous experience. Those who had experience, had spent at least two years in previous activity, but most had experience of over 5 years, and 40 per cent of over 10 years. Majority of the entrepreneurs in

Lucknow, Ghaziabad, Allahabad, Bulandshahr and Unnao were experienced, mostly in same line of activity as their present factory deals in; but those with no previous experience dominated the sample of entrepreneurs in Agra, Meerut, Saharanpur, Dehradun, Aligarh, Mirzapur, Nainital, Mathura and Jaunpur.

Entrepreneurs' Assessment of Locational Factors

Rarely does one find a single factor act as the motivating force behind a location decision. There are a number of economic factors that an entrepreneur may like
so
to consider/as to assess the potential performance of a location. Besides, the non-economic factors also feature as important influences, which, to a certain extent, may be considered by entrepreneurs as compensating for the unfavourable economic situation. Therefore the entrepreneurs mention more than one factor as motivating them to locate their factory where it is, so that we have as many as 997 responses from 292 entrepreneurs of the sampled factories.

If we accept the frequency by which a factor is mentioned as a measure of its importance, some of the non-economic factors seem to emerge as having the most important

influence in location (Table IV - 8(a) and 8(b)). Pre-
ference for the place of their origin and residence is
found to have weighed with 63 per cent entrepreneurs in
deciding the location of their factories. Attraction of
good social and community life features as one of the con-
siderations for 16 per cent of the entrepreneurs. The
former/found to have been mentioned most often by entre-
preneurs in all product groups except in glass products,
cement and hume pipes and repair of motor vehicles; and,
in all districts except Ghaziabad, Nainital, and Sitapur.
Better social and community life was mentioned as one of
the motivating factors, by a significant number of entre-
preneurs in Varanasi, Lucknow, Bareilly, Jaunpur and Unnao.

Among the group of economic factors, the availability
of raw material locally was the most frequently mentioned
factor : 45 per cent of entrepreneurs reported that it was
one of the factors influencing their location decision.
Entrepreneurs in industry groups oil and grain mill products
and straw board and mill board found it a important factor
most often; but it seemed of little significance in the
location of units in industries like cycle tyres and tubes
and repair of motor vehicles. A related factor, proximity

Table - IV - 3 (?)

Entrepreneurs Assessment of Locational Facilities (Industrywise)

Locational Factors \ Industry	205.3	211.0	280.5	300.3	310.1	321.1	323.1	329.1	331.1	331.3	340.3	343.5	345.2	350.2	973.0	Total
Entrepreneur belonged to this place	15	14	8	8	7	6	15	6	39	10	14	4	25	8	8	184
Better social and Community life	3	4	3	3	1	1	1	1	6	5	3	1	9	4	1	47
Availability of raw material	7	24	8	2	2	5	6	5	27	8	11	2	21	6	1	151
Proximity to producers of intermediate products	1	2	1	1	2	1	2	1	1	3	5	1	2	1	2	24
Existence of similar units	3	4	4	2	1	2	10	2	17	4	5	1	11	2	17	84
Availability of skilled labour	1	2	2	1	1	1	8	1	11	4	4	1	7	2	3	51
Cheap local labour	3	6	5	2	1	3	2	3	11	1	6	1	3	2	8	50
No. Industrial unrest	3	1	2	1	1	3	3	3	6	5	3	3	7	2	1	42
Transport connection to raw material source	1	8	1	2	2	3	1	3	7	3	6	1	9	6	2	53
Transport connection to main market	1	6	1	1	2	5	1	5	4	1	8	1	9	8	3	52
Banking facilities	1	1	3	1	2	2	1	2	6	5	3	1	10	2	1	39
Better town supply	1	3	5	1	1	2	1	2	5	2	3	1	7	2	1	27
Market (local/away)	10	6	5	2	2	1	7	1	21	4	12	2	18	4	7	114
Industrial estate	1	1	1	2	3	5	4	5	16	2	3	2	8	4	1	55
Please at favoured terms	1	1	5	1	1	4	1	4	3	1	4	1	3	1	1	23
Tax on duty exemption	3	1	1	2	1	1	3	1	2	1	1	2	1	2	1	7
Any other	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	6
Any other	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	8
No. of Units	22	25	12	11	13	7	18	12	53	15	24	7	37	14	21	292

Table - IV - 8 (b)

Districtwise Assessment of Locational Factor

District / Locational Factors	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehra Dun	Moradabad	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Total
Entrepreneur belonged to this place	14	29	13	5	20	8	4	12	-	8	6	15	9	3	3	3	14	4	3	6	6	1	18
Better Social Life	11	13	1	1	4	5	-	-	-	-	1	-	1	1	1	2	1	-	3	-	4	-	4
Raw material availability	9	18	19	2	22	5	4	9	-	8	1	8	4	3	1	3	6	3	1	-	2	3	15
Proximity to Intermediate Products	6	8	1	1	6	1	-	-	1	-	1	1	1	1	-	2	2	1	-	-	2	-	21
Existence of Similar Units	6	15	8	-	14	2	-	2	2	5	-	2	3	-	-	3	10	-	-	8	2	1	84
Availability of Skilled Labour	4	10	8	-	12	-	-	-	-	-	-	5	3	1	-	1	8	4	-	2	2	1	51
Cheap Local Labour	3	3	14	1	7	1	1	2	-	1	2	5	2	-	1	1	2	-	-	2	2	-	50
No. Industrial Unrest	4	1	2	1	8	-	-	3	-	5	1	2	1	-	3	1	3	4	3	2	1	-	44
Transport Connection to Raw Material Source	7	7	4	-	9	3	-	2	-	-	3	1	2	-	-	1	1	-	-	7	3	3	55
Transport Connection to Main Market	9	8	2	1	10	3	-	1	-	1	1	2	2	-	1	-	1	-	-	8	2	1	55
Banking Facility	1	13	1	1	9	1	1	4	-	-	-	1	1	4	-	1	6	-	1	7	6	1	35
Better Power Supply	3	6	10	1	9	2	1	-	-	1	3	8	1	-	-	1	4	-	3	3	1	3	27
Market (Local or near)	14	26	-	1	12	2	-	-	-	1	1	4	2	-	-	-	-	-	-	8	6	3	114
Industrial Estate	7	5	-	-	24	2	-	4	-	-	1	1	2	-	-	-	4	-	3	2	1	1	55
Finance at Favoured Terms	6	2	-	-	4	3	-	-	-	-	1	-	2	-	-	-	1	-	1	-	1	-	22
Tax and Duty Exemption	3	1	-	-	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	
Any other	1	1	-	-	2	-	-	-	-	-	2	-	3	-	-	-	3	-	1	-	1	1	
Any other	-	1	-	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	1	8
No. of Units	20	51	30	6	35	8	4	16	2	16	7	18	12	4	3	10	17	5	3	10	9	5	29x

to the producers of _intermediate products_ was found
to be of some consequence in eight per cent cases, mostly
in basic industrial chemicals, steel pipes and nuts,
bolts and metal containers. A majority of units in Agra,
Ghaziabad, Lucknow, Bijnor, Saharanpur, Mirzapur, Mathura,
and Sitapur considered raw material availability impor-
tant, and a sizeable percentage of them in Kanpur, Gha-
ziabad, Bareilly and Unnao considered proximity to the
producers of intermediate products a factor influencing
their location decision. _Existence of similar units_ in
the vicinity also seems to provide a positive influence on
location, probably because it facilitates ease of access
to certain common industrial facilities and inputs already
available : 29 per cent of the entrepreneurs considered
it important, most prominently in the industry groups china-
ware, repair of motor vehicles, casting and forging, cycle
tyres and tubes and metal utensils. Such units featured
prominently in Kanpur, Varanasi, Agra, Ghaziabad, Lucknow,
Moradabad, Allahabad, Bulandshahr and Gorakhpur districts.

The next most frequently mentioned factor is the
nearness to the _market_ : around two-fifths of entrepreneurs
considered it as influencing location. It featured most

Transport connection to the market and source of
raw material each was mentioned by 15 per cent of entre-
preneurs as a factor in location. Transport link to the
market was most frequently mentioned by units in cement
and hume pipes, nuts, bolts and metal containers and light
agricultural machinery and equipment; and in Varanasi,
Ghaziabad, Lucknow, Gorakhpur and Sitapur district. In
oil and grain mill products, straw board and mill board,
and light agricultural machinery and equipment, transport
connection to the raw material head was considered important
by most units. Units located in Varanasi, Lucknow, Mirzapur
Gorakhpur and Sitapur districts found it important most
often in influencing their location.

Since banking facilities are generally available in
most of the centres, it may not have had a differential
influence in the entrepreneurs' choice of location. Yet it
was mentioned as favourable factor by 13 per cent entrepre-
neurs most often in Kanpur, Ghaziabad, Gorakhpur and Unnao.
Finance on favoured terms influenced location decisions in
only 8 per cent cases, strangely enough, mostly in the non-
backward districts like Varanasi, Lucknow and Gorakhpur;
Varanasi and Ghaziabad also have some entrepreneurs who found
certain tax and duty exemptions as motivating their location.

Better <u>power supply</u> featured as a factor in only
less than 10 per cent cases probably because no location
in Uttar Pradesh has a particularly better power supply
to attract location significantly on this account. Yet
over 20 per cent of the units in Ghaziabad, Lucknow and
Gorakhpur thought that they located their units there
because of better power supply. Existence of <u>industrial</u>
<u>estates</u> attracted location of units in a district in 19
per cent cases. Over two-thirds of the Ghaziabad entrepre-
neurs reported that it influenced their decision to
located their factories there. Its influence was also found
significant in Varanasi and Meerut.

Let us now sum up the entrepreneurs' assessment of
the factors affecting their decisions regarding to locate
their units by industry and district. The following emerge
as the important considerations in the order mentioned as
factors in location in each of the 15 selected industries.
(Factors mentioned by at least one-third of the entrepre-
neurs only are listed. Percentages in the brackets being
those of entrepreneurs mentioning the respective consideration).

1. <u>Bakery and Milk Products</u>
    1. Entrepreneurs' native place(68%)
    2. Proximity to market (45%)
    3. Availability of raw material(33%)

2. <u>Oil and grain mill products</u>
    1. Availability of raw
       material   (96%)
    2. Entrepreneurs'
       native place   (56%)
    3. Transport connection
       to raw material
       source   (33%)

3. <u>Straw Board and Mill Board</u>
    1. Proximity to market (100%)
    2. Entrepreneurs'
       native place   (66%)
    3. Availability of raw
       material   (66%)
    4. Transport connection
       to raw material
       source   (33%)

4. <u>Cycle Tyres and Tubes</u>
    1. Entrepreneurs'
       native place   (72%)
    2. Industrial Estate   (45%)
    3. Existence of similar
       unit   (36%)

5. <u>Basic Industrial Chemicals</u>
    1. Entrepreneurs' native
       place   (54%)
    2. Proximity to market (54%)

6. <u>Glass Products</u>
    1. Entrepreneurs' native
       place   (43%)
    2. Transport connection
       to main market   (43%)

7. <u>China-ware</u>
    1. Entrepreneurs' native
       place   (83%)
    2. Existence of similar
       units   (56%)
    3. Availability of skilled
       labour   (44%)
    4. Proximity to market (39%)

8. Cement and Hume Pipes   1. Entrepreneurs' native place (50%)

2. Availability of raw material(42%)

3. Transport connection to
   main market   (42%)

4. Industrial Estate   (42%)

9. Casting and Forging   1. Entrepreneurs' native place (74%)

2. Availability of raw material(51%)

3. Proximity to market   (40%)

4. Industrial Estate   (33%)

10 Steel Pipes   1. Entrepreneurs' native place (66%)

2. Availability of raw material(52%)

11 Nuts, Bolts and Metal   1. Entrepreneurs' native place (58%)
Containers

2. Proximity to market   (50%)

3. Availability of raw material(46%)

4. Transport connection to
   main market   (33%)

12 Agricultural Handtools   1. Entrepreneurs' native place (56%)
and Implements   2.

13 Metal Utensils   1. Entrepreneurs' native place (68%)

2. Availability of raw material(58%)

3. Proximity to market   (48%)

14 Manufacture of light   1. Entrepreneurs' native place (57%)
agricultural machinery
and equipment   2. Transport connection to
   main market   (57%)

3. Transport connection to
   raw material source   (37%)

15 Repair of Motor Vehicles 1 Existence of similar units   (80%)

2. Entrepreneurs' native place (36%)

3. Cheap local labour   (36%)

Among the districts also one finds a similar pattern
of considerations mentioned by the entrepreneurs as influ-
encing their location decision. The consideration of being
'local' was found to have weighed with most of the entre-
preneurs in all districts except in Dehradun, Gorakhpur and
Sitapur. Availability of raw material also featured as a
major consideration in over half the districts. Cheap
local labour seems to have significance in Agra and Mathura,
and lack of industrial unrest in Nainital, Bareilly and
Jaunpur. Existence of an Industrial Estate seems to have
attracted a significant number of entrepreneurs in Meerut
and Ghaziabad. Availability of power was not considered as
a significant factor favouring a particular district for
location of factories.

Besides, their own assessment of the favourable
factors for location quite a few entrepreneurs also had the
benefit of advice, consultation and assistance from others
-- officials, fellow industrialists. In 26 per cent cases,
mostly in Varanasi, Agra, Ghaziabad, Aligarh, Allahabad,
Mirzapur, Bulandshahr, Jaunpur, Gorakhpur and Sitapur districts,
the fellow industrialists provided information and advice

which helped in deciding the location. In 12 per cent
cases, mostly in Varanasi, Kanpur, Ghaziabad, Mirzapur
and Bulandshahr, government officials were found helpful
in the process of location and in two cases, one in
Ghaziabad and other in Allahabad, some political leaders
also assisted in getting the industry located there.

Problems Due to Location

Even though personal factors, particularly domicile
of the entrepreneur has been mentioned most frequently as
one of the factors influencing the decision on location,
the influence of other, particularly economic, factors
influencing the cost and market cannot be reduced to in-
significance. In fact, it may be argued that entrepreneurs'
assessment of the various economic advantages and dis-
advantages of different locations probably did not yield
any significant variation among districts, and given more
or less similar cost and market situation, the domicile
of the entrepreneur provided the final influence on the
decision. The entrepreneurs' assessment could, however,
go wrong. But, by and large, it looks that entrepreneurs'
assessment is vindicated by experience. The problems that

they have faced in their operations in the recent past
are generally common to all locations, and only marginally
specific to a location.

Around one-third of the entrepreneurs' reported no
problems; they constituted the majority of the sample in
industry groups bakery and milk-products and cycle tyres
and tubes; and in districts Varanasi, Dehradun and Mirzapur.
On the other hand, over-two-thirds of units in Ghaziabad,
Meerut, Kanpur, Gorakhpur, Agra, Bijnor, Moradabad, Muza-
ffarnagar, Bareilly and Bulandshahr, reported one problem
or the other due to their location. Of the various problems
reported by the units, those related with the supply of
power were most often mentioned; over one-third of the
units spread all over the State and different industry
groups complained on this account. The problem is common
to all products and locations; but its severity was felt
more often by units in casting and forging and metal products.
The problem was reported less acute in Varanasi, Saharanpur,
Aligarh, Allahabad, Bareilly and Mathura where it was men-
tioned as a problem by less than one-fifths of the units.
On the other hand, over three-fourths of the units in Gha-
ziabad, Gorakhpur and Sitapur reported affected by the
problems of availability of power.

The next important problem faced by units related to raw material. Shortage of raw material affected 29 per cent units, and non-availability on time 11 per cent; 15 per cent complained of poor quality and 10 per cent of high prices of raw material. In most cases the raw material used is produced locally. In 54 per cent cases, the entire raw material is locally procured, in 27 per cent cases, both local and outside sources are combined, and only in 19 per cent cases the entire raw material is from outside. While in bakery and milk-products, oil and grain mills and cement and hume pipes, the raw material is mostly available locally, in metal utensils it is mostly procured from outside. Among districts, Kanpur, Agra, Mirzapur, Saharanpur, Bareilly and Sitapur units primarily rely on local sources for the procurement of raw materials, while Varanasi, and Unnao units use material mostly procured from outside. In rest of the districts, both sources are important; but local sources are used more often than outside sources in most of these districts.

The problem relating to raw material, mostly of the availability as such, was found rather acute by units in oil and grain mill products, Straw board and mill board, basic industrial chemicals and metal utensils; most of the units

in casting and forging units faced one or the other type
of problem regarding raw material, quantity, quality,
timely availability and price. District-wise, it was
found that factories in Kanpur and Agra mostly complained of
shortage of raw material; those in Meerut and Bareilly
complained of unfavourable prices of raw material, those
in Ghaziabad of its quality, and many of them/Moradabad
and Saharanpur of timely availability.

The next important problem reported facing around 20
per cent of the units is the shortage of skilled labour.
This problem is found to be mainly affecting units in glass
products, cement and hume pipes, agricultural implements
and metal utensils. Industries in Kanpur, Ghaziabad,
Allahabad and Moradabad reported it as a problem of signi-
ficant magnitude.

Market is not found to be a very important constraint
in the functioning of the units in most industry groups and
locations. Only 10 per cent of the units considered it as
a problem. In fact 90 per cent of the product of the sampled
units is sold at the factory site itself, another three per-
cent through the factory depot outside and seven per cent
through dealers. Units producing straw board and mill board,

and agricultural hand tools, and implements; and, those located in Bijnor, Saharanpur, Gorakhpur, Unnao and Varanasi sell a larger proportion through dealers. The only products groups in which 'market' was reported as a problem by quite a few entrepreneurs are : casting and forging, repair of motor vehicles and china-ware; and the districts in which the units reported it as such are : Bulandshahr, Moradabad and Kanpur. Finance was also not found to be a problem except by a small number, less than 5 per cent of units.

It looks that despite a heavy weight of the personal factors, particularly of the domicile of the entrepreneurs, in their decision on location, their assessment does not seem to have gone wide off the mark. Most of the problems faced in operations are hardly location-specific in the present situation. The most common problem faced by them relates to the availability of power which seems common to all locations in the State with only marginal variations. Otherwise no location seems so offer a definite advantage or disadvantage over the other, in general. On the basis of the respondents' expression of problems, however, Varanasi Lucknow, Mirzapur, Jaunpur, Saharanpur, Dehradun, Allahabad,

Bareilly, Bulandshahr, Mathura and Unnao seem to emerge as less problematic locations, and Ghaziabad, Gorakhpur, Meerut, Kanpur, Agra, Moradabad, and Sitapur as those posing more problems among the locations considered here.

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Chapter - V
COMPARATIVE ADVANTAGE AND LOCATION

The economic factors that are considered for assessing the advantages and dis-advantages of a location would ultimately get reflected in the operational results of production in terms of costs and revenue. In brief and precise terms, the locational advantage of places can be compared in terms of these indicators. The indicator most often used for summarising the relative advantage of a location vis-a-vis others is cost per unit of output. Assuming a perfectly competitive market across locations, the unit cost would measure the relative advantage. But if the revenue per unit also varies among locations, it would prove an inadequate measure. And in practice, it is not realistic to assume that the space revenue curve takes the shape of a horizontal straight line, the price variations are often greater than can be accounted for by transport costs. It is, therefore, desirable to adopt a measure which takes care both of the cost and market conditions, thus allowing for spatial variations in price and revenue. The indicator that we have, therefore, chosen for the economic analysis of the comparative advantage of different

locations is cost to output ratio (COR), measured as
cost per rupee value of the output. Inverse of this
ratio can be taken to measure the surplus per rupee of
output value.

Cost-Output Ratios (CORs)

The comparative locational advantage of the various
selected districts ~~impressented~~ in terms of the CORs in
different districts, in respect of the selected industries
in the sample is presented in Table V - 1. The COR of
all industries in the sample is found to be the lowest in
Lucknow at 0.73 and the highest in Sitapur at 0.93. Most
of the other districts show only a marginal (less than 5
per cent) variation from the average of 0.83. Thus it
looks that, in general, the overall locational advantages
or disadvantages of individual districts are only marginally
different from each other. The districts which show a signi-
ficant variation from the average cost-price ratio are
Lucknow and Dehradun on the advantageous side, and Sitapur,
Saharanpur, Bulandshahr and Nainital, on the disadvantageous
side.

Table - V - 1

Districtwise and Industrywise Cost-Output Ratios (COR)

Industry / District	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehra Dun	Moradabad	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Total
205.3	0.71	0.76	-	-	-	-	-	0.84	-	0.86	-	0.76	0.76	-	-	0.87	-	-	0.76	0.77	-	-	0.76
211.0	0.93	0.82	0.87	-	-	0.70	-	0.97	-	0.94	-	0.77	0.87	-	-	0.88	-	-	-	-	0.90	0.94	0.85
220.3	0.74	0.46	-	-	0.90	-	0.86	0.94	-	-	0.88	0.74	-	-	-	-	-	-	-	-	0.77	-	0.86
300.3	0.70	0.80	-	0.91	0.85	-	-	0.86	-	-	0.74	-	-	-	-	-	-	-	-	-	-	-	0.81
310.1	0.75	0.82	-	-	0.96	-	-	-	-	-	-	-	-	-	-	-	-	0.78	-	-	-	-	0.82
321.1	-	-	0.85	-	-	0.75	-	-	-	-	-	-	0.87	-	-	-	-	-	-	-	-	-	0.84
322.1	-	-	0.71	-	-	-	-	-	-	-	-	-	-	-	-	-	0.89	-	-	-	-	-	0.85
329.1	0.68	-	-	0.72	0.76	0.91	-	-	-	-	-	-	0.64	-	0.85	-	-	0.87	-	0.90	-	-	0.81
331.1	0.95	-	0.75	0.36	0.83	0.71	0.81	0.91	-	0.79	0.63	0.82	0.88	0.69	-	0.89	-	0.80	0.82	0.72	0.85	-	0.82
331.3	0.82	-	0.87	-	0.83	-	-	0.83	-	-	-	-	-	-	0.92	-	-	-	-	-	0.79	-	0.84
340.3	0.86	-	0.85	-	0.89	0.87	-	0.97	-	-	-	0.84	0.84	-	-	-	-	-	-	-	0.79	0.96	0.88
343.5	-	-	-	0.88	-	0.86	-	-	-	0.80	-	-	-	-	-	0.76	-	-	-	-	-	-	0.82
345.2	0.82	0.88	0.91	-	0.78	0.86	0.76	0.85	-	0.80	0.82	0.77	-	0.87	-	-	-	-	0.88	0.84	-	-	0.84
350.2	0.79	0.69	-	-	0.79	-	-	0.90	-	-	0.88	0.85	-	-	-	-	-	-	-	-	-	0.76	0.82
373.0	-	0.76	0.85	-	-	-	-	0.84	0.76	0.85	-	0.69	-	-	-	0.81	-	-	-	0.70	0.57	-	0.77
District Ratio	0.81	0.81	0.84	0.81	0.86	0.86	0.73	0.83	0.92	0.84	0.80	0.79	0.84	0.85	0.88	0.84	0.89	0.85	0.85	0.78	0.81	0.93	0.82

We however, come across larger variations in cost-price ratio in case of some of the individual industry groups. For this exercise, we consider only such industry groups which are found in at least half a dozen of the selected districts. Bakery and Milk-products yield an average ratio of 0.76; of the nine districts for which we have relevant figures, four, Kanpur, Aligarh, Allahabad and Jaunpur conform with the average, Gorakhpur shows a marginal disadvantage with a COR of 0.77. But Varanasi shows a distinct advantage with a COR of 0.70 and Bareilly, Moradabad and Saharanpur seem rather unfavourable locations for this industry to the extent one rupee of output in these districts costs Re 0.87, 0.86 and 0.84 respectively. Within the group bakery and milk-products, biscuits also show similar variations; equal to the average of 0.76 in Kanpur and Aligarh; 0.78 in Allahabad, 0.73 in Varanasi but 0.87, 0.86 and 0.84 in Bareilly, Moradabad and Saharanpur.

Oil and Grain Mill Products is an industry with a rather high (0.85) COR and also shows wide variations in the ratio among districts. Although Kanpur, Agra, Allahabad and Bareilly show only small variations from the average,

Saharanpur, Varanasi, Sitapur and Moradabad show highly
unfavourable figures at 0.97, 0.95, 0.94 respectively;
while figure for Lucknow is highly favourable at 0.70
followed by that for Aligarh at 0.77. We have comparable
figures for a few districts for mustard oil and ground
nut oil within this group. While the former shows only
marginal variations in COR, in the latter the differences
are large. Production of one rupee worth of mustard oil
costs 83 paise on an average, it costs 84 paise in Varanasi,
82 paise in Kanpur, 85 paise in Agra, 88 paise in Allahabad
and 77 paise in Aligarh. Ground-nut oil costs 85 paise
per rupee of output on an average, but it costs as high as
97 paise in Saharanpur; 93 paise in Agra and Sitapur and
92 paise in Moradabad; and as low as 70 paise in Lucknow.

Straw and Mill Board also has a high average COR at
0.86, but it is found to be the highest at 0.94 in Saharan-
pur and lowest at 0.74 in Varanasi and Aligarh. In Kanpur,
Ghaziabad, Bijnor, Muzaffarnagar and Unnao, it is not very
different from the average. Cement and Hume Pipes show
wide variations in cost per rupee of output : 0.91 in Lucknow,
0.90 in Gorakhpur, 0.87 in Mathura, 0.85 in Nainital, but
only 0.64 in Allahabad, 0.68 in Varanasi, 0.72 in Meerut and
0.76 in Ghaziabad, against the State average of 0.83.

In <u>casting and forging units</u> one rupee of realised revenue entails a cost of Re. 0.82, on an average. In most of the districts the figure is lower or higher than the average by five paise or less, but it is lowest at 0.69 at Mirzapur followed by Lucknow at 0.71 and highest at 0.93 in Varanasi followed by Allahabad at 0.88. Within this group, <u>industrial machinery</u> units turn out a very favourable ratio at 0.72 in Gorakhpur, while in the three other districts Muzaffarnagar, Agra, and Ghaziabad, where we have sample units in this industry, the COR is not very different from the average of 0.82.

In another metal engineering group, <u>nuts, bolts and metal containers,</u> units in Kanpur, Agra, Ghaziabad, Lucknow, Aligarh and Allahabad, show a cost to output ratio very near the average of 0.88, but Saharanpur and Sitapur units have highly unfavourable ratios of 0.97 and 0.96 respectively. <u>metal utensils</u> units have the lowest ratio in Bijnore (0.76) and the highest in Agra (0.91). Varanasi, Ghaziabad, Moradabad, Muzaffarnagar and Aligarh are other districts with below average cost and Kanpur, Lucknow, Saharanpur, Mirzapur and Jaunpur with above average cost per rupee of output in this industry. In <u>aluminium utensils</u>

Aligarh, Bijnor and Ghaziabad score over other districts
with a cost output ratio of below 0.80, while in brass
utensils Moradabad alone has below average cost-price
ratio at 0.80. Manufacture of agricultural machinery
and equipment is found to cost the least in relation to
value of output in Sitapur (COR = 0.76) followed by
Varanasi and Meerut; and the highest in Saharanpur and
Kanpur (COR = 0.90 in each).

Pattern of Comparative Advantage

We can now sum up the pattern of relative advantage
shown by various districts in different lines of manufa-
cture in terms of cost per unit of value of output, which
reflects both the cost and the market dimensions of
locational advantage and disadvantage. Overall, Lucknow,
Dehradun, Gorakhpur, Muzaffarnagar and Aligarh provide
the most advantaged location; Varanasi, Kanpur, Agra,
Bijnor, Moradabad, Allahabad, Bareilly, Unnao, Mirzapur
Mathura and Jaunpur offer average locational advantage;
while Sitapur, Saharanpur, Bulandshahr, Nainital and Ghazi-
abad provide the least advantageous locations in that order.
The first category of locations give roughly a surplus of
20 to 25 paise per rupee of market value of the product;

in the second category the surplus is between 15 to 20
paise per rupee and in the last category it is between
10 to 15 paise per rupee. Lucknow as the most advantageous
location yields a surplus of 27 paise, and Sitapur and
Saharanpur as the least advantaged locations seven and
eight paise per rupee of output. These findings, however,
relate to the overall industrial structure; relative
position of different districts in respect of each of the
selected industry groups is summonised below (Table V - 2).

Distance from Most Advantageous Location (MAL) and COR

The most advantageous location presumably has distinct
favourable conditions on the availability of material,
labour and other inputs at low prices, and/or provides markets
or proximity to it so as to enable the producers to realise
a higher value of output. In case there is a unique ideal
location on these basis, the advantages of locations will
tend to get reduced as we move away in space from such a
location. Let us examine if such a situation is found to
obtain in Uttar Pradesh, in the case of all and different
industries. Are there districts which provide unique location
solutions? And/does the Advantages get reduced with distance
from such locations?

Table V-2

LOCATIONAL ADVANTAGE OF DISTRICTS

Industry (with average cost-output ratio in parenthesis)	Distinct Locational advantage	Districts with	
		Average Location Conditions	Locational Disadvantage
1	2	3	4
1. Bakery and Milk Products (0.76)	Varanasi (0.71)	Kanpur (0.76), Aligarh (0.76), Allahabad (0.76), Jaunpur(0.76), Gorakhpur (0.77)	Saharanpur (0.84), Moradabad (0.86), Bareilly (0.87)
Biscuits (0.76)		Varanasi (0.73), Kanpur (0.76), Allahabad (0.78)	Saharanpur (0.84), Moradabad (0.86), Bareilly (0.87)
2. Oil and Grain Mill Products (0.85)	Lucknow (0.70), Aligarh (0.77)	Kanpur (0.82), Agra (0.81), Allahabad (0.87), Bareilly (0.88)	Varanasi (0.95), Saharanpur (0.97), Moradabad (0.94), Unnao (0.90), Sitapur (0.94)
Mustard Oil (0.85)	Aligarh (0.77)	Varanasi (0.84), Kanpur (0.82), Agra (0.85)	Allahabad (0.88)
Ground-nut oil (0.85)	Lucknow (0.70), Aligarh (0.79)	Bareilly (0.86), Unnao (0.89)	Agra (0.93), Saharanpur (0.97), Moradabad (0.92), Sitapur (0.93)
3. Straw Board Mill Board (0.86)	Varanasi (0.74), Aligarh (0.74), Unnao (0.77)	Kanpur (0.86), Bijnor (0.88)	Ghaziabad (0.90), Muzaffarnagar Saharan-pur (0.94)
4. Cycle Tyres Tubes (0.81)	Varanasi (0.73), Muzaffarnagar(0.74)	Kanpur (0.80), Meerut (0.81), Ghaziabad (0.85), Saharanpur(0.86)	
Cycle Tubes (0.79)	Varanasi (0.73), Muzaffarnagar(0.74)	Kanpur (0.80), Meerut (0.85), Ghaziabad (0.85)	Saharanpur (0.86)

LOCATIONAL ADVANTAGE OF DISTRICTS

1	2	3	4
5. Chemicals (0.82)	Varanasi (0.75)	Kanpur (0.82), Mathura (0.78)	Ghaziabad (0.96)
Drugs (0.82)	Mathura (0.78)	Kanpur (0.84)	
Industrial Gases (0.74)		Varanasi (0.75), Kanpur (0.74)	
Paints (0.84)		Kanpur (0.82)	Ghaziabad (0.93)
6. Glass Products (0.84)	Lucknow (0.75)	Agra (0.85)	Allahabad (0.87)
Glass Bottles (0.87)		Agra (0.87), Allahabad (0.87)	
7. Chine-ware (0.85)	Agra (0.71)		Bulandshahr (0.89)
8. Cement and Hume Pipes (0.81)	Meerut (0.72), Varanasi (0.68), Ghaziabad (0.76), Allahabad (0.64)	Nainital (0.85)	Lucknow (0.91), Mathura (0.87), Gorakhpu-r (0.90)
9. Casting and Forging (0.82)	Lucknow (.071), Mirza-pur (0.69), Gorakhpur (0.72)	Kanpur 0.87), Agra (0.78), Meerut (0.86), Ghaziabad (0.82), Bijnor (0.81), Moradabad (0.79), Muzaffarnagar (0.83), Aligarh (0.82), Mathura (0.80), Jaunpur (0.82), Unnao (0.85)	Varanasi (0.93), Saharanpur (0.91), Allahaba-d (0.88), Bareilly (0.89)

LOCATIONAL ADVANTAGE OF DISTRICTS

1	2	3	4
10. Industrial Machinery (0.82)	Gorakhpur (0.72)	Muzaffarnagar (0.81), Ghaziabad (0.83), Agra (0.83)	
11. Steel Pipes (0.84)	Unnao (0.79)	Kanpur (0.82), Agra (0.87), Ghaziabad (0.85), Saharanpur(0.88)	Nainital (0.92)
12. Nuts, Bolts and Metal Containers (0.88)		Kanpur (0.86), Agra (0.88), Ghaziabad (0.89), Lucknow (0.87), Aligarh (0.84), Allanabad(0.84).	Saharanpur (0.97), Sitapur(0.96),
13. Agriculture Implements (0.85)	Ghaziabad (0.77), Moradabad (0.79), Unnao (0.79)	Varanasi (0.89), Kanpur (0.89), Agra (0.81), Meerut (0.88), Bijnor (0.84), Muzaffarnagar (0.87), Aligarh (0.87), Bareilly (0.81)	Saharanpur (0.90)
14. Metal Utensils (0.84)	Ghaziabad (0.78), Bijnor (0.76), Aligarh (0.77)	Varanasi (0.82), Kanpur (0.88), Lucknow (0.86), Saharanpur(0.85), Moradabad (0.80), Muzaffarnagar (0.82), Mirzapur (0.87), Jaunpur (0.88), Gorakhpur (0.88)	Agra (0.91)
15. Aluminium Utensils (0.84)	Bijnor (0.76), Aligarh (0.74)	Varanasi (0.85), Kanpur (0.84), Ghaziabad (0.79), Lucknow (0.86), Muzaffarnagar (0.87), Jaunpur (0.87), Gorakhpur (0.88)	Agra (0.91)
Brass Utensils (0.84)		Agra (0.87), Bijnor (0.86), Moradabad (0.80), Aligarh (0.85), Mirzapur (0.86)	Kanpur (0.91)

LOCATIONAL ADVANTAGE OF DISTRICTS

1	2	3	4
15. Agricultural Machinery and Equipment (0.52)	Sitapur (0.76)	Varanasi (0.79), Ghaziabad (0.79), Aligarh (0.86)	Kanpur (0.89), Saharanpur (0.90), Muzaffarnagar(0.88)
16. Repair of Motor Vehicles (0.YYYYYY)	Aligarh (0.69),Gorakhpur (0.70), Unnao (0.57)	Kanpur (0.76), Dehradun (0.76), Bareilly (0.81)	Agra (0.83) Saharanpur (0.84), Moradabad (0.85)
Threshers (0.92)	Bijnor (0.80), Moradabad (0.76), Muzaffarnagar (0.80)	Varanasi (0.94),Kanpur (0.89), Aligarh (0.91)	

FIGURE 1

DISTRICTWISE COST PER RUPEE OF OUTPUT — ALL INDUSTRY

SCALE: 1cm = 36Kms

0.82 Avg

COST PER RUPEE OF OUTPUT.

DEHRA DUN
SAHARANPUR
MUZAFFAR NAGAR
BIJNOR
GHAZIABAD
BULAND SHAHR
MEERUT
MATHURA
NAINI TAL
ALIGARH
MORADABAD
AGRA
BAREILLY
SITAPUR
KANPUR
UNNAO
LUCKNOW
ALLAHABAD
JAUNPUR
GORAKHPUR
VARANASI
MIRZAPUR

1.0   .90   .80   .70   .60   .50
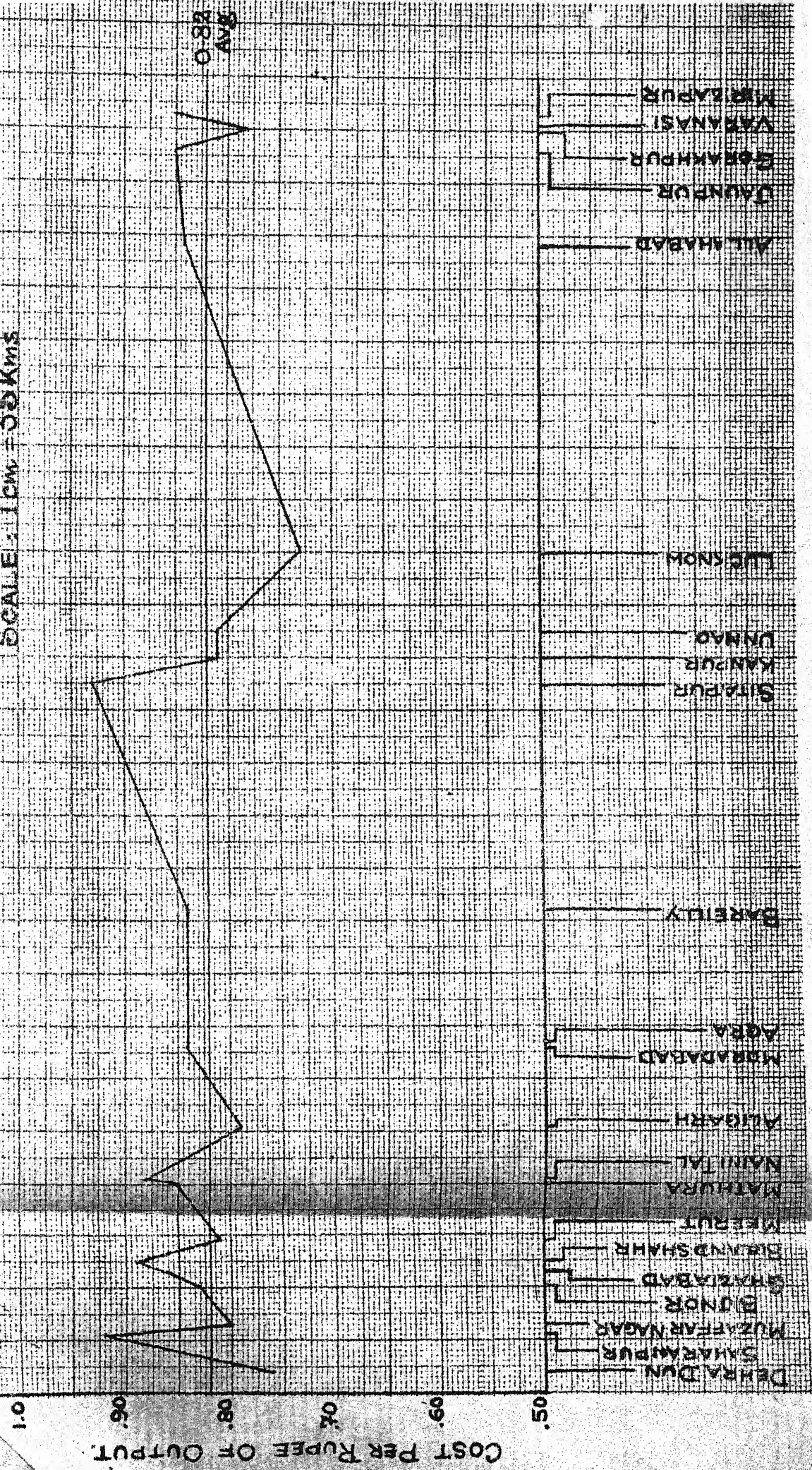
We have attempted answer to these questions by
plotting COR of each location on a graph measuring dis-
tance on the horizontal axis. Lucknow is taken to be
the Centre and other districts are placed on its right
and left in line with their actual distance from Lucknow.
Space is treated as a linear variable on the two-dimensional
figures, but all districts located west of Lucknow are on
the left and those located in the east are on thr right
of Lucknow.

In the aggregate, all industries situation, Lucknow
represents the most advantageous location (MAL) (Figure 1).
To some extent, ~~immapassy~~ locations away from Lucknow on
eighter side have increasing trend in COR in line with
distance. But this tendency is not continued over the
entire space. Varanasi in the east and Aligarh, Meerut and
Muzaffarnagar in the west provide other locations with low
COR. Roughly, therefore, there appear to be not one, but
three troughs in the COR plotted over the space, suggesting
three different clusters of districts, each with its own
central point in terms of the MAL.

FIGURE-2

PER RUPEE OF OUTPUT — INDUSTRY 205:3
[Bakery & Milk Products]

Rs. /Re.

Cost Per Rupee Of Output

1·0   ·90   ·80   ·70   ·60   ·50

SAHARANPUR   ALIGARH   MORADABAD   BAREILLY   KANPUR   ALLAHABAD   JAUNPUR   GORAKHPUR   VARANASI
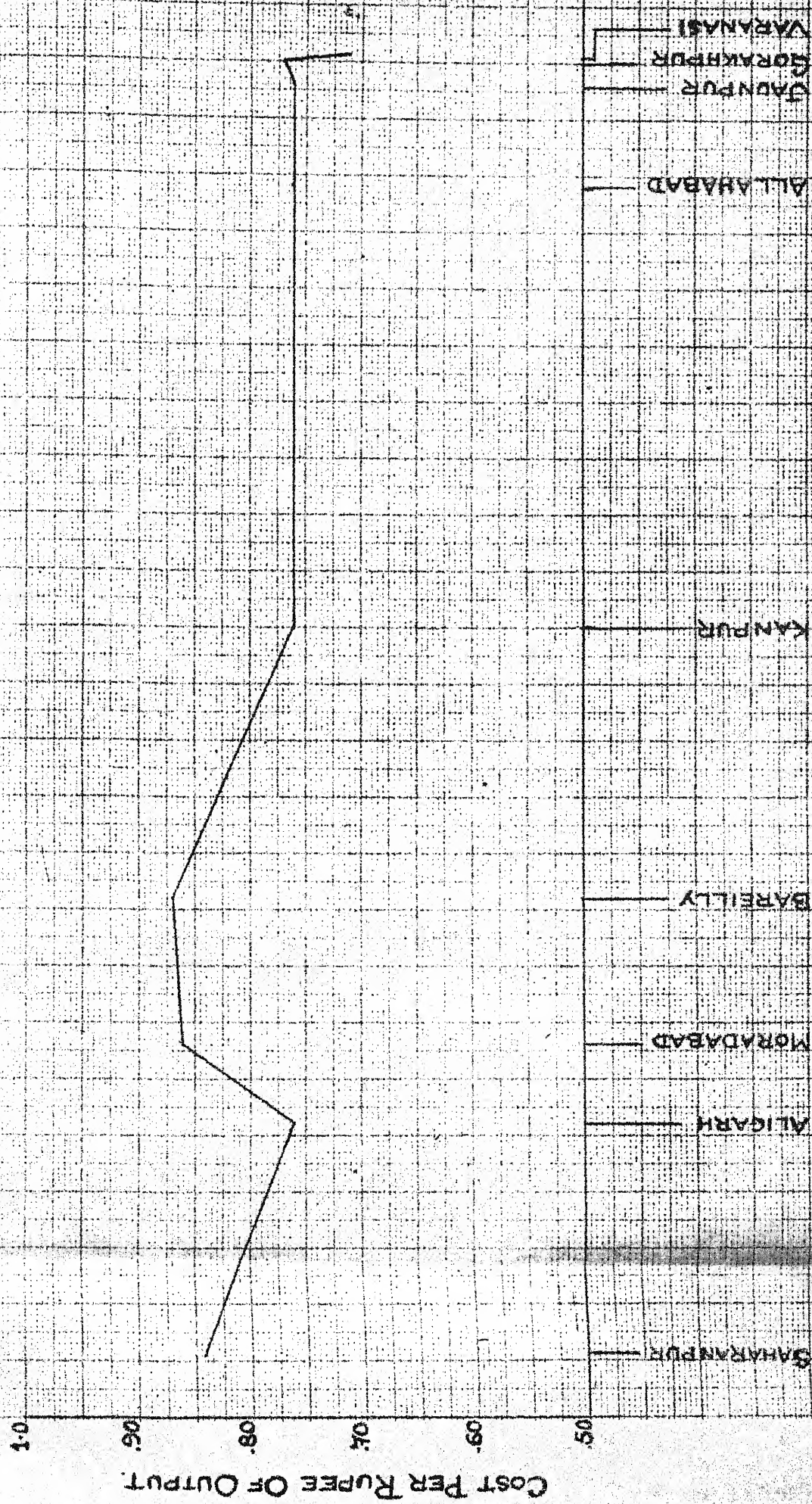
FIGURE - 3

COST PER RUPEE OF OUTPUT — INDUSTRY 211·0

Oil & Grain Mill Products

Cost Per Rupee Of Output.

1·0 ·90 ·80 ·70 ·60 ·50

SAHARANPUR ALIGARH MORADABAD AGRA BAREILLY SITAPUR KANPUR UNNAO LUCKNOW ALLAHABAD VARANASI
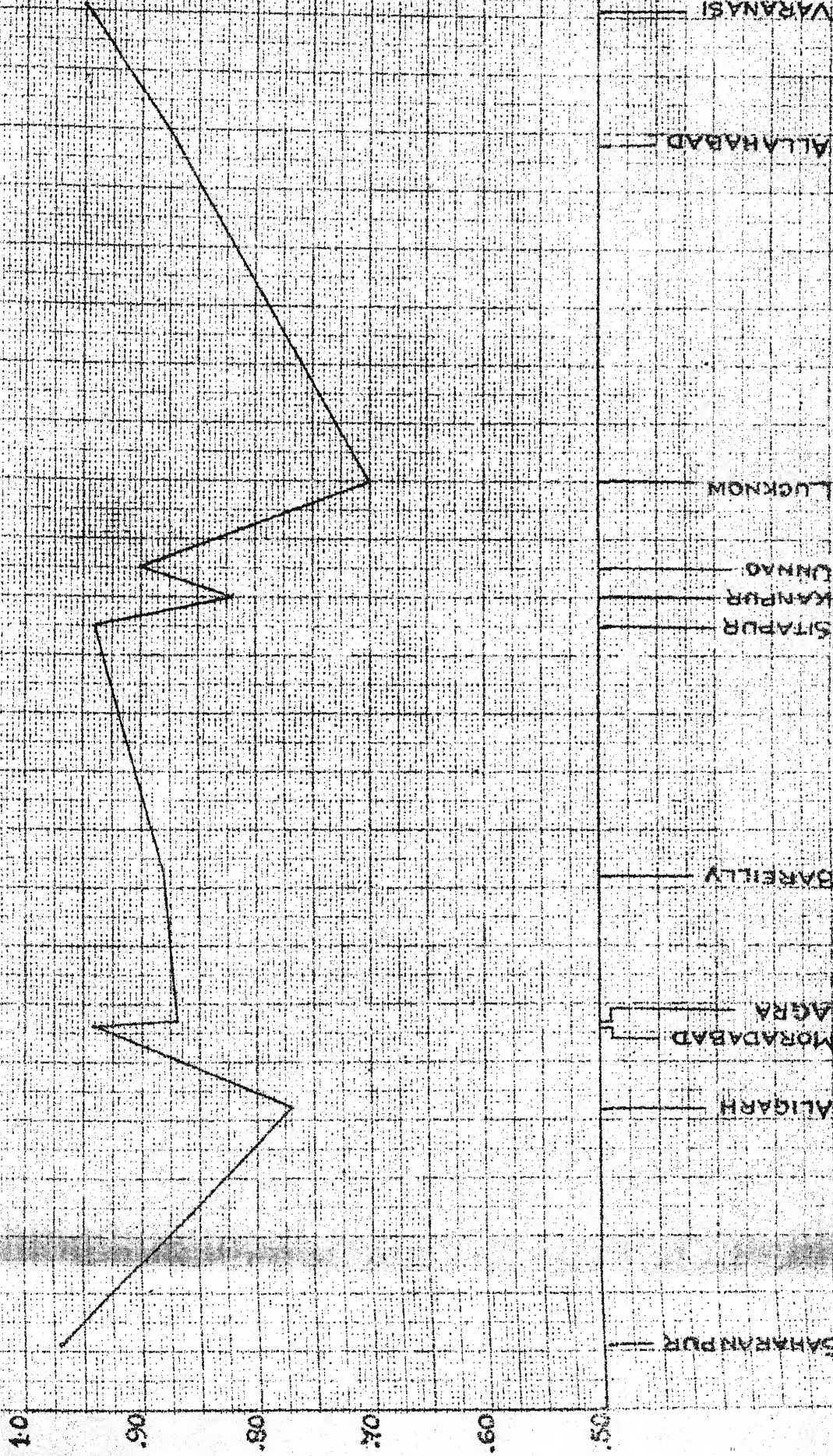
FIGURE-4

COST PER RUPEE OF OUTPUT — INDUSTRY 280·5

[Strawboard & Millboard]
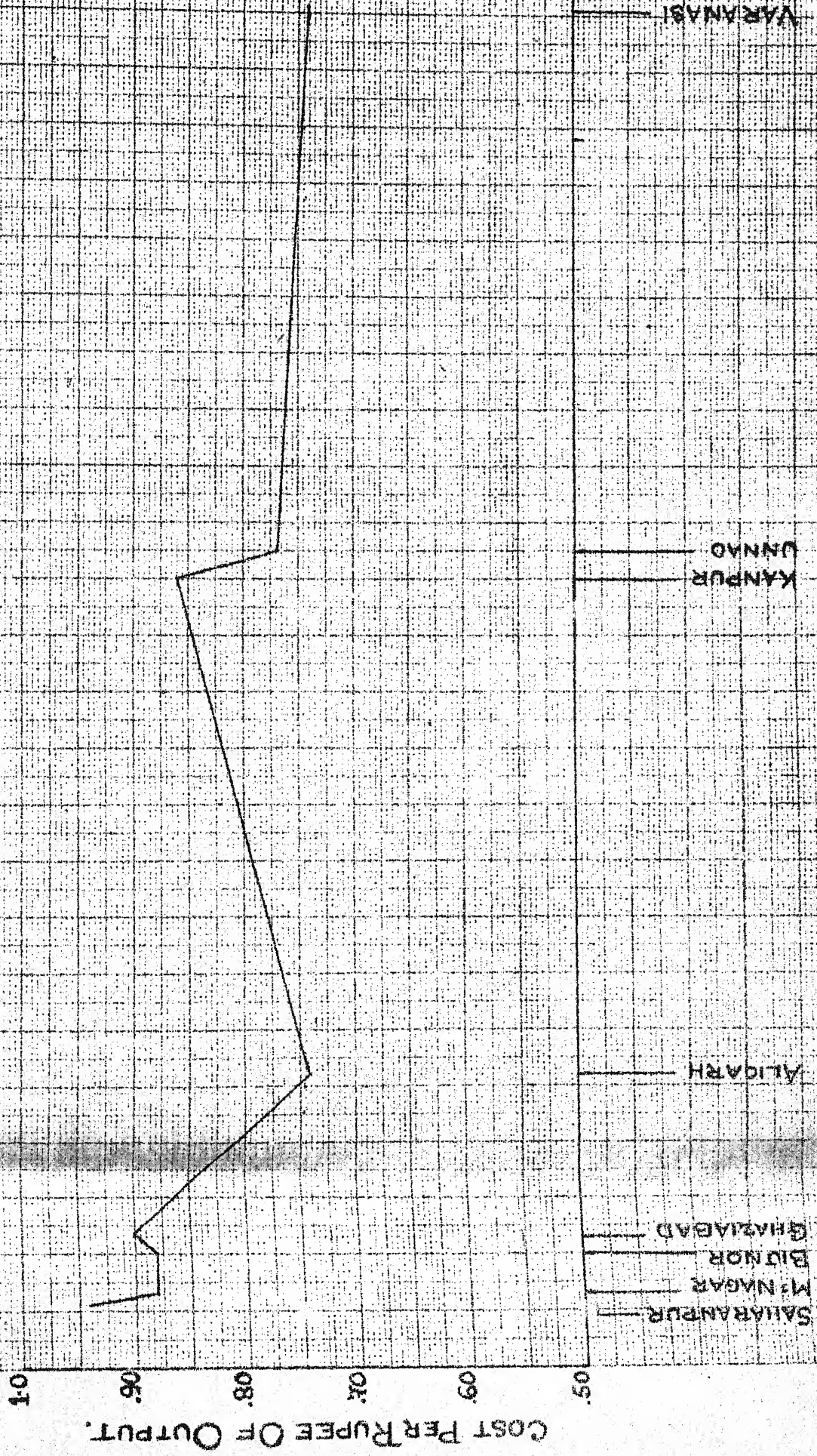
Cost Per Rupee Of Output.

Cement & Hume Pipes.

Cost Per Rupee of Output.

1.0
.90
.80
.70
.60
.50

MEERUT
MATHURA
NAINITAL
LUCKNOW
ALLAHABAD
GORAKHPUR
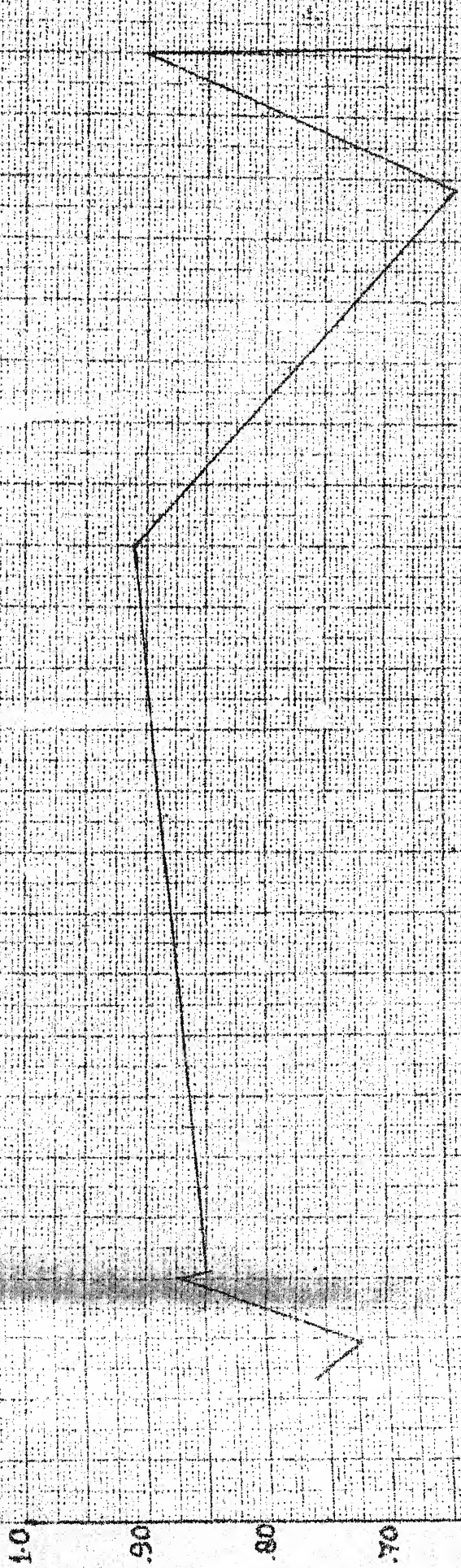
For the industry group, <u>bakery and milk products</u> distance from the MAL, namely Varanasi, shows a decline in advantage as COR increases as one moves West, till one reaches Aligarh which offers another favourable location (Figure 2). Thus Varanasi and Aligarh emerge as the two idea locations, distance from each of them tends to increase COR, till, of course one comes in the proximity of the other. In <u>Oil and grain mill products</u> (Figure 3) the central parts of U.P. provide distinct advantage over the extreme east and west; Lucknow offers the MAL, but Aligarh also seems to provide another ideal location in the western region. Similarly in the manufacture of <u>straw-board and mill-board</u> Varanasi and Aligarh offer relative advantage in the east and west respectively, distance from either district within the respective region tends to yield a increasingly higher COR (Figure -4). For <u>Cement and Hume pipes</u>, again eastern and western parts of U.P. have two different MAL, Allahabad in the east and Meerut in the West (Figure -5).

In <u>Casting and Forging</u> Lucknow provides the MAL, but the COR does not show a continuous tendency to increase with distance in either direction. Gorakhpur seems an

FIGURE - 6 — INDUSTRY 331·1

[Casting & Forging.]

COST PER RUPEE OF OUTPUT.
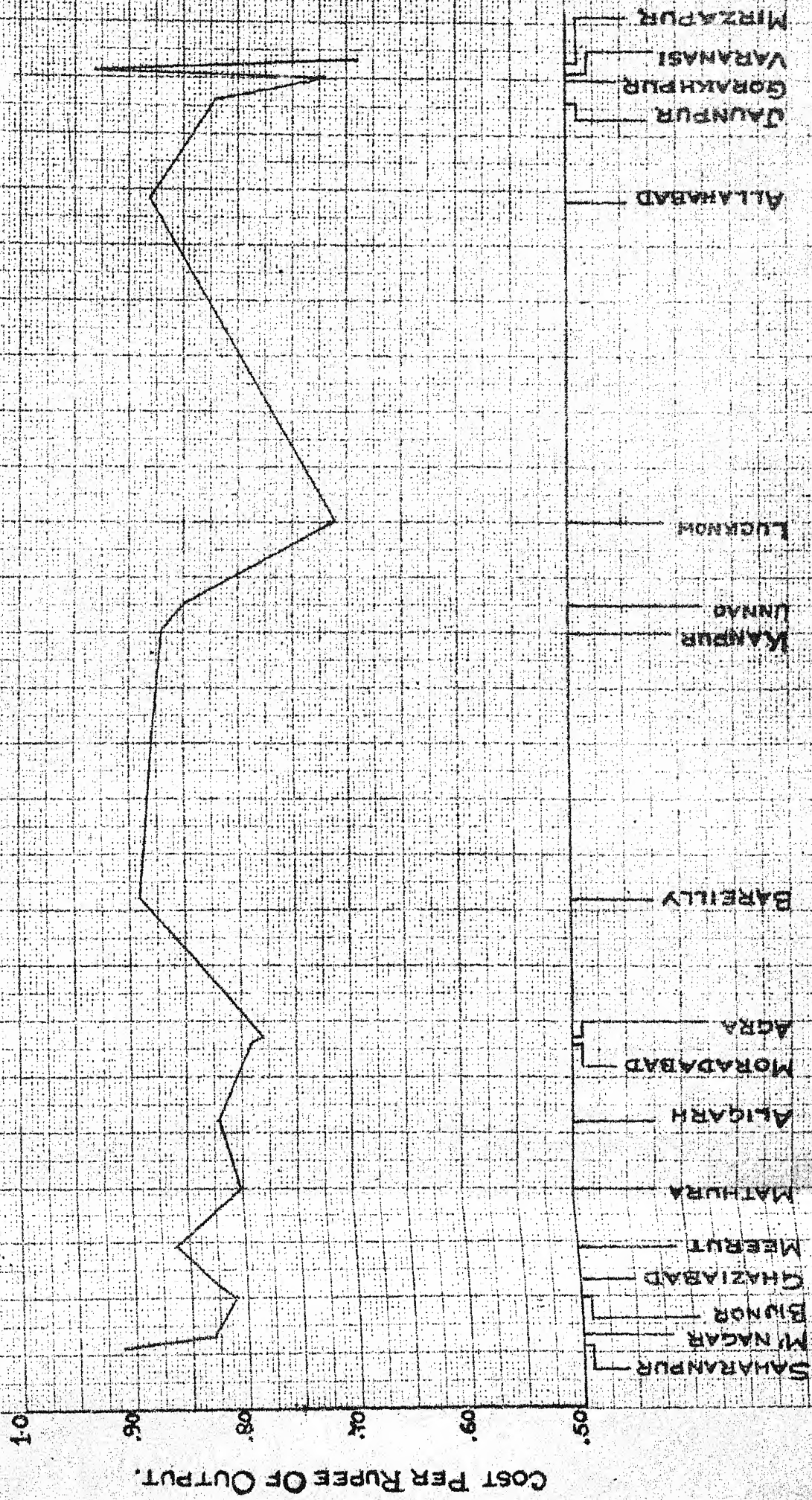
FIGURE-7

Cost Per Rupee of Output — INDUSTRY 340·3
[Nuts and Bolts]

COST PER RUPEE OF OUTPUT

ALLAHABAD

LUCKNOW

KANPUR
SITAPUR

AGRA

ALIGARH

GHAZIABAD
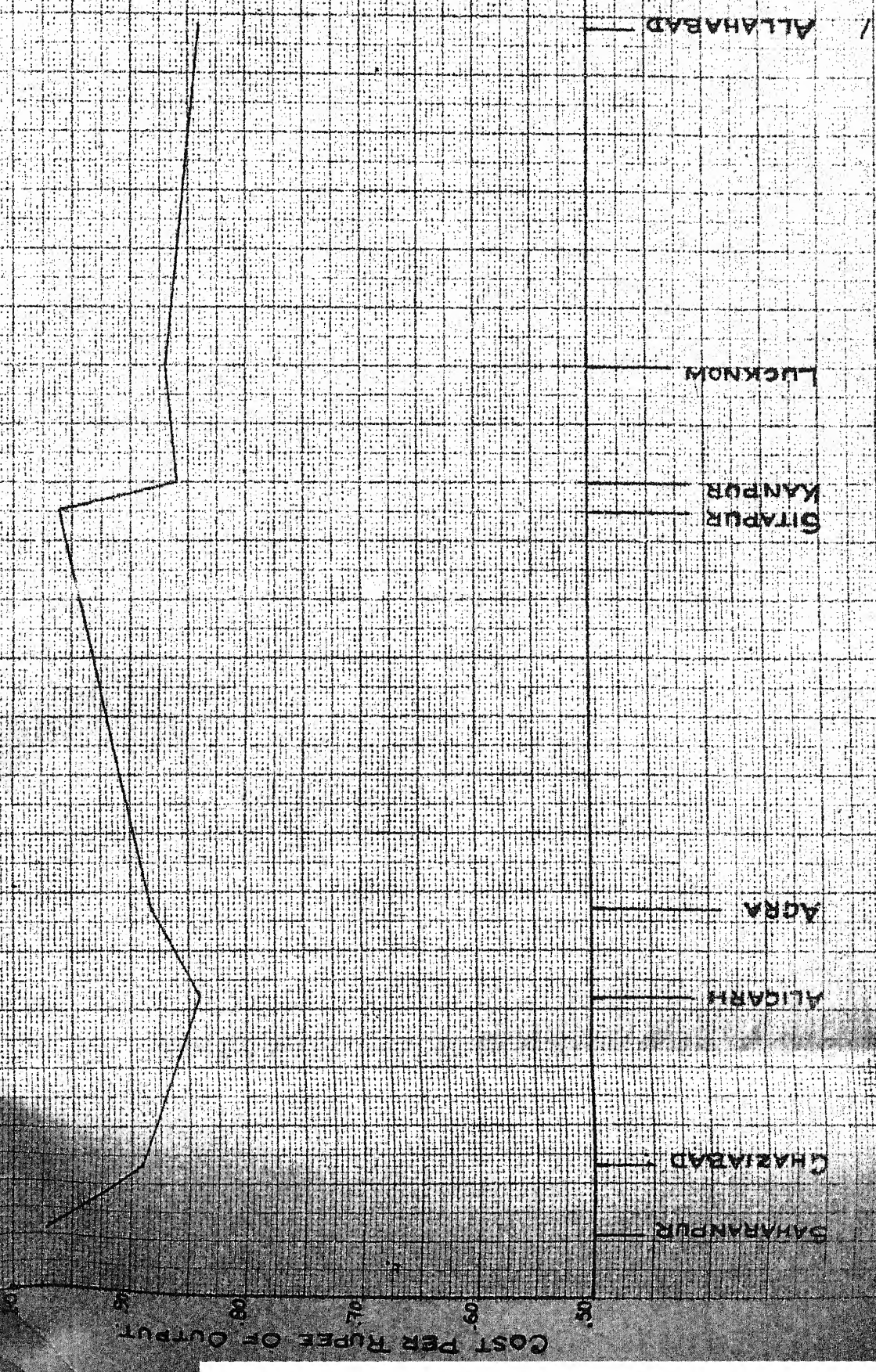
SAHARANPUR

FIGURE 3

Cost Per Rupee Of Output — INDUSTRY 345·2 [Metal Utensils]

Cost Per Rupee Of Output.

1·0
·90
·80
·70
·60
·50

SAHARANPUR
M' NAGAR
BIJNOR
GHAZIABAD
ALIGARH
MORADABAD
AGRA
KANPUR
LUCKNOW
JAUNPUR
GORAKHPUR
VARANASI
MIRZAPUR
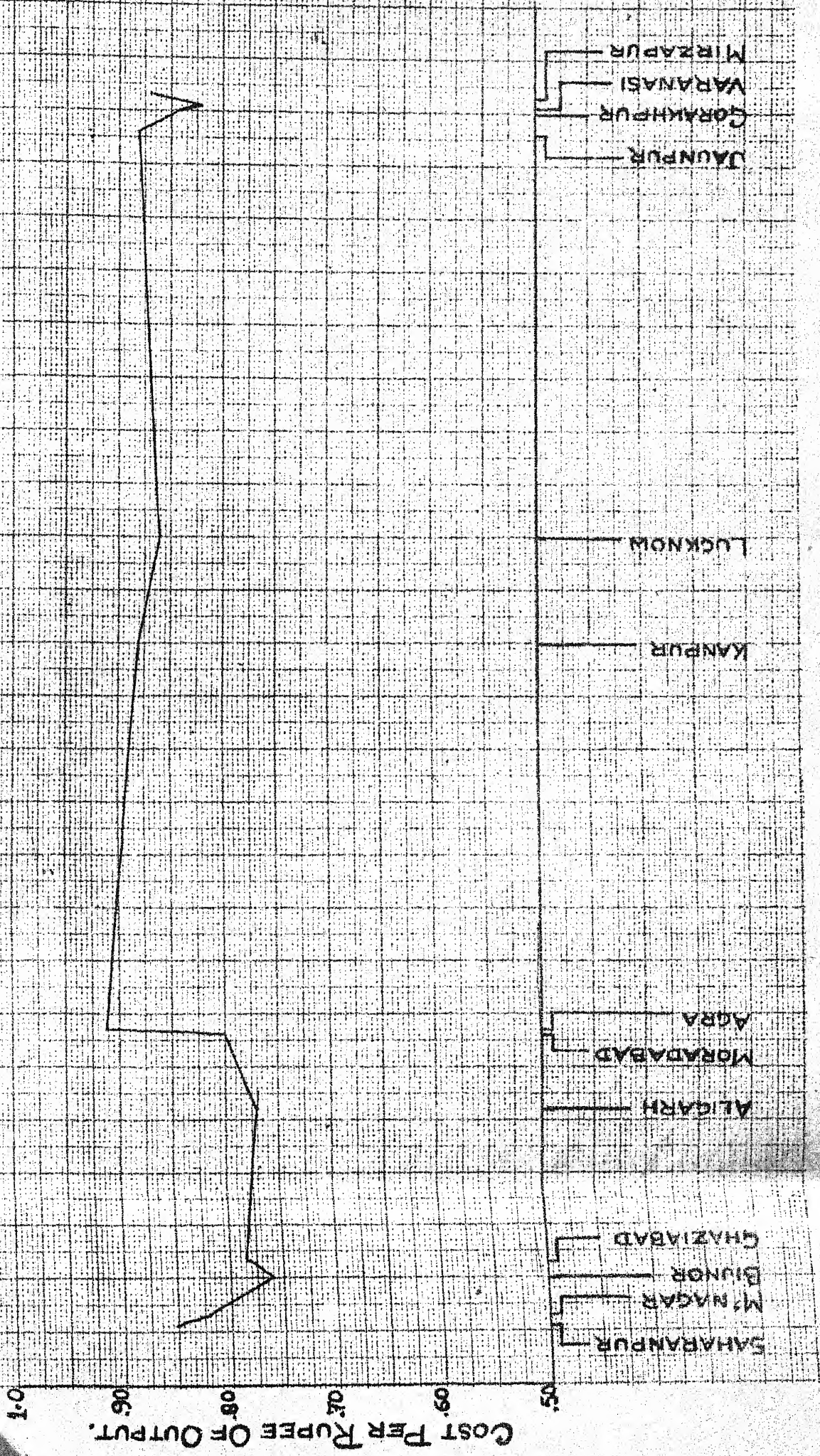
FIGURE-9

INDUSTRY 350·2

[Light Agri. Machinery]

COST PER RUPEE OF OUTPUT

COST PER RUPEE OF OUTPUT

1·0 ·90 ·80 ·70 ·60 ·50

VARANASI

KANPUR
SITAPUR

ALIGARH

GHAZIABAD
M.NAGAR
SAHARANPUR
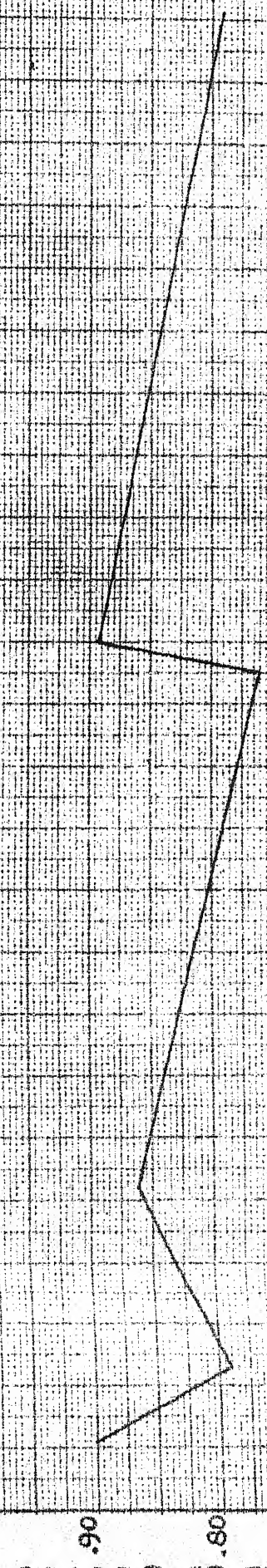
independent MAL *in* the eastern region and Agra and
Moradabad in the western region (Figure -6). For the
manufacture of <u>nuts and bolts</u> Allahabad and Aligarh *provide MAL*/in
the east and west respectively, the central and extreme
western parts of the State show a higher COR more or
less in relation to the distance from these two locational
points (Figure -7). In the production of <u>metal utensils</u>
Bijnor provides the MAL, the districts nearer it Moradabad,
Aligarh, Ghaziabad and Muzaffarnagar show slightly higher
COR but, the more distant locations show significantly
higher COR (Figure -8). In the east Varanasi shows better
advantage than the other districts in the region as well
as in the central parts. In the manufacture of <u>light
agricultural machinery</u> Sitapur provides the MAL, but as
can be seen from Figure -9, there seem three different
advantageous locations for each of the eastern, central
and western regions; Varanasi, Sitapur and Muzaffarnagar
respectively.

The above pattern of the MAL for different industries
and behaviour of COR in relation to the distance from each
MAL suggests that in most of the industries the entire

State cannot be taken as one spatial unit for the
analysis and policy on location. It is found that there
is no unique ideal location for any industry; but there
are different advantageous locational points for different
parts, at least for the Eastern, Central and Western parts.
It seems that the markets for raw materials which is the
major cost-item in all industries are regional in chara-
cter, and even the markets for the products are so to
some extent. For most industry, therefore, there seem to
be more than one MAL points, broadly one in each of the
three regions; in some cases, of course, only two regions
could be identified. These points seem to provide the
stimulus for growth of a given industry, other locations
in the region offer lesser advantages.

The pattern of the MAL and COR behaviour over space
has some useful implications for policy on incentives and
subsidies for the industrial development of backward areas.
Basically, these instruments are used to compensate the
less advantaged location so as to bring its COR to the
level of the MAL. For this purpose it is necessary that
incentives and subsidies are graded by the degree of dis-
advantage of different locations. The degree of disadvan-
tage of a location could be measured in terms of the excess

of COR of a location over that of the MAL. In the case
of Uttar Pradesh the principle could be applied on a
regional basis and disadvantages could be measured in
relation to the MAL of the region. To the extent the
difference in COR from the MAL is in line with distance
from it, the implementation of the instruments of incen-
tives and subsidies gets simplified as, in that case their
magnitude could be related to the distance from the MAL
of the region.

Cost-Components and COR

Let us now examine which of the cost items make a
location advantageous or other-wise. For this purpose we
have only indirect data on raw material and labour input
for different industries and location, in terms of the
cost of these inputs as a proportion of the value of output.
Price per unit of input could probably be a more direct
indicator for assessing comparative advantage in terms of
each inputs; but such information could not be reliably
collected for raw material, although for labour we have
average wages per worker which have also been used in this
analysis.

Raw material makes the major component of value of product in all industries : the average material output ratio (MOR) for all industries is 67 per cent, but it is high in bolts, nuts and metal containers (75%), oil and grain mill products (73%) and cycle tyres and tubes (71%), and rather low in chemicals (48%), chinaware (50%), repair of motor vehicles (55%), and glass products (58%) (Table V - 3). In all other industry groups MOR ranges between 60 and 70 per cent. Among districts, the combined ratio for all industries in the district included in the sample, is high in Sitapur (89%), Mirzapur (78%), Nainital (76%), Meerut (74%) and Saharanpur (72%); and low in Dehradun (52%), Muzaffarnagar (54%), Gorakhpur (53%), Unnao (55%) and Bulandshahr (56%).

Nuts, bolts and metal containers is the most raw material intensive industry with an MOR of 0.75, but the ratio is low at 0.57 in Lucknow, and at 0.89 in Sitapur in this industry. The next material intensive industry, oil grain mill products have an average MOR of 0.73; the ratio is only 0.55 in Kanpur and 0.65 in Aligarh, but 0.90 in Sitapur and 0.88 in Varanasi. Cycle tyres and tubes have an average MOR of 0.71, but it is only 0.49 in Muzaffarnagar and 0.61 in Varanasi.

Table – V – 3

Raw Material to Output Ratios (ROR)

District / Industry	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehra Dun	Moradabad	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Industry Ratio
205.3	0.57	0.63	-	-	-	-	-	0.73	-	0.48	-	0.54	0.57	-	-	0.55	-	-	0.52	0.54	-	-	0.63
211.0	0.68	0.55	0.74	-	-	0.67	-	0.69	-	0.83	-	0.65	0.80	-	-	0.76	-	-	-	-	0.65	0.90	0.73
280.5	0.47	0.70	-	-	0.39	-	0.70	0.67	-	-	0.53	0.67	-	-	-	-	-	-	-	-	-	-	0.64
300.3	0.61	0.62	-	0.76	0.72	-	-	0.69	-	-	0.49	-	-	-	-	-	-	0.57	-	-	0.35	-	0.70
310.1	0.42	0.47	-	-	0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.48
321.1	-	-	0.63	-	-	0.44	-	-	-	-	-	-	0.43	-	-	-	-	-	-	-	-	-	0.58
323.1	-	-	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	0.56	-	-	-	-	-	0.50
329.1	0.56	-	-	0.50	0.68	0.62	-	-	-	-	-	0.37	0.37	-	0.74	-	-	0.78	0.57	-	-	-	0.89
331.1	0.85	0.66	0.65	0.58	0.62	0.52	0.70	0.69	-	0.61	0.70	0.64	0.49	0.60	-	0.70	-	0.68	0.56	0.36	0.65	-	0.63
331.3	0.64	-	0.71	-	0.64	-	-	0.85	-	-	-	-	-	-	0.81	-	-	-	-	0.56	0.56	-	0.70
340.3	0.74	-	0.75	-	0.74	0.57	-	0.80	-	-	-	0.73	0.76	-	-	-	-	-	-	0.89	-	0.89	0.75
343.5	-	-	-	0.55	-	-	-	-	-	0.63	-	-	-	-	-	0.54	-	-	-	-	0.63	-	0.60
345.2	0.60	0.59	0.79	-	0.66	0.61	0.62	0.70	-	0.67	0.60	0.65	-	0.81	-	-	-	-	0.66	0.60	-	-	0.63
350.2	0.66	0.70	-	-	0.57	-	-	0.78	-	-	0.57	0.69	-	-	-	-	-	-	-	-	-	0.57	0.65
973.0	-	0.56	0.68	-	-	-	-	0.66	0.52	0.62	-	0.45	-	-	-	0.46	-	-	-	0.50	0.16	-	0.55
District Ratio	0.65	0.60	0.70	0.74	0.69	0.61	0.63	0.72	0.32	0.70	0.54	0.66	0.68	0.78	0.76	0.61	0.56	0.75	0.59	0.55	0.55	0.89	0.67

On the other hand, even in an industry like che-
micals with low material intensity, Ghaziabad units have
to spend 70 per cent of their output value on material,
whereas the percentages is as low as 42 in Varanasi and
Kanpur. In another less material intensive industry,
china-ware, Bulandshahr units have a MOR of 0.59 while
those in Agra only 0.37. Casting and forging with 0.63
as average MOR shows wide variation : ranging from 0.36
in Gorakhpur to 0.83 in Varanasi, but this is an industry
with variegated structure of products, and different
districts have highly different product structures.
Considering a less aggregative product group within this
industry, namely industrial machinery, the variations in
MOR are found to be much less between 0.72 in Gorakhpur
to 0.83 in Varanasi and Ghaziabad. In other product groups
the variations are, though significant, not very wide.

Wage cost is found to be rather a small part (7 per
cent) of the value of output in aggregate (Table V - 4).
Yet units in glass products, china-ware, chemicals, agri-
culture machinery and equipment, repair of motor vehicles,
straw board products and agricultural hand tools and
implements have high wages to output ratio (WOR) of 0.20,
0.19, 0.15, 0.13, 0.12, 0.12 and 0.10 respectively; and

Table - V - 4

Wages to Output Ratio (WOR)

Industry	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehra Dun	Moradabad	Muzaffar-Nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Industry
203.3	0.09	0.05	–	–	–	–	–	0.10	–	0.30	–	0.10	0.09	–	–	0.25	–	–	–	0.17	–	–	0.17
211.0	0.04	0.01	0.09	–	0.17	0.01	0.14	0.11	–	0.04	0.18	0.04	0.04	–	–	0.08	–	–	–	0.15	0.02	0.01	0.03
280.5	0.11	0.13	–	0.03	–	–	0.17	0.14	–	–	0.05	0.05	–	–	–	–	–	–	–	–	0.30	–	0.12
300.3	0.09	0.07	–	–	0.04	–	–	0.09	–	–	–	–	–	–	–	–	–	0.10	–	–	–	–	0.05
310.1	0.16	0.16	0.18	–	0.08	0.18	–	–	–	–	–	–	0.30	–	–	–	–	–	–	–	–	–	0.15
321.1	–	–	0.24	–	–	0.15	–	–	–	–	–	–	0.12	–	0.08	–	0.16	0.06	–	0.27	–	–	0.20
322.1	–	–	–	0.16	0.09	0.05	0.06	0.09	–	0.09	0.09	0.06	0.16	0.08	–	0.08	–	0.07	0.22	0.22	0.07	–	0.15
329.1	0.10	–	0.07	–	0.07	–	–	0.13	–	–	–	–	–	–	0.09	–	–	–	–	–	0.11	–	0.09
331.1	0.06	0.12	0.03	0.20	0.07	0.21	–	0.08	–	0.08	–	0.06	0.04	–	–	–	–	–	–	–	–	0.09	0.09
331.2	–	0.07	0.08	0.22	0.07	–	–	0.06	0.08	0.06	0.12	0.06	–	–	–	0.07	–	–	–	–	0.10	0.09	0.07
344.3	–	0.07	–	–	0.07	0.16	–	0.07	–	–	0.14	0.14	–	0.02	–	–	–	–	0.12	0.07	–	–	0.03
345.3	–	0.08	0.06	–	–	–	–	–	–	–	0.13	0.13	–	–	–	–	–	–	–	–	–	0.09	0.10
345.2	0.12	0.09	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.12	–	–	0.07
354.2	0.11	0.09	0.09	–	–	–	–	0.17	0.17	0.20	–	0.15	–	–	–	0.19	–	–	–	0.06	–	0.12	0.12
372.0	0.14	0.14	–	–	–	–	–	0.20	0.15	0.13	–	–	–	–	–	–	–	–	–	–	0.34	–	0.12
Districts Ratio	0.13	0.08	0.09	0.04	0.07	0.05	0.07	0.12	0.20	0.07	0.10	0.06	0.08	0.05	0.05	0.08	0.16	0.07	0.14	0.08	0.07	0.02	0.07

oil and grain mill products and cycle tyres and tubes a WOR of 0.05 or less. Among districts, Dehradun shows the highest WOR of 0.20 followed by Bulandshahr and Jaunpur at 0.14, Varanasi at 0.13; and Saharanpur at 0.12 and, Mirzapur has the lowest at 0.03 followed by Meerut at 0.04 and Lucknow at 0.04. Obviously, a large part of these differences are due to different industrial structure of districts. But even within an individual group, the differences are sometimes inexplicably large. In bakery products, Moradabad and Bareilly units pay 30 and 25 per cent of the value of output as wages to workers, while the percentage is only 6 in Kanpur and 9 in Varanasi and Allahabad. In straw board and straw-mill products the ratio ranges from 0.03 in Aligarh to 0.30 in Unnao; in cement and hume pipes between 0.06 in Mathura and 0.48 in Ghaziabad; in casting and forging between 0.05 in Lucknow and 0.22 in Jaunpur and Gorakhpur; in nuts, bolts and metal containers between 0.04 in Allahabad and 0.21 in Lucknow; and in repair of motor vehicles between 0.6 in Gorakhpur to 0.34 per cent in Unnao.

Overall, it seems that the COR is more in line with the MOR; primarily due to the dominance of raw material cost in almost all product groups. The W_oR might vary among

districts due to variations in product structure and technology in a given product, or due to inter-district differences in wage rates. The average wage for the entire sample works out to Rs.3184 per worker per annum. (Table V-5). Mathura has the highest wage at Rs.4043 followed by Kanpur at Rs.3761, Ghaziabad at Rs.3637 and Varanasi Rs.3453. At the other end, Bulandshahr pays the lowest wage at Rs.1396, Bijnor Rs.1458, Jaunpur Rs.2014, Meerut Rs.2325. Wage rates are found to vary less across industries than districts. Average wages in industries range mostly between Rs.2400 and Rs.3600, with, of course, glass products and chemicals paying much higher at Rs.6045 and 4491 respectively and china-ware paying the lowest at Rs.1744. But within an industry also wages vary significantly, for example, between Rs.1293 in Varanasi and Rs.3496 in Kanpur in bakery and milk products; between Rs.955 in Unnao and Rs.4833 in Agra, in oil and grain mill products; between Rs.970 in Ghaziabad and Rs.5714 in Muzaffarnagar in straw board and mill board; and between Rs.930 in Ghaziabad and Rs.6744 in Varanasi, in chemicals.

Table V – 5 : Wages per Worker (W)

District / Industry	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehradun	Moradabad	Muzaffar-Nagar	Aligarh
1	2	3	4	5	6	7	8	9	10	11	12	13
205.3	1292.68	3496.26	-	-	-	-	-	-	-	-	-	2569.39
211.0	2855.17	2931.54	4833.20	-	-	-	-	1790.90	-	2700.00	-	2941.18
280.5	2823.32	3158.36	-	-	-	3227.27	-	2598.88	-	4404.21	5714.46	3087.00
300.3	3356.77	3002.91	-	-	970.00	-	2329.36	2796.87	-	-	2211.01	-
310.1	6744.44	5076.03	-	2031.36	2169.46	-	-	3379.96	-	-	-	-
321.1	-	-	2031.58	-	930.30	2087.49	-	-	-	-	-	-
323.1	-	-	2775.43	-	-	-	-	-	-	-	-	-
329.1	3687.0	-	-	5318.93	2283.41	2058.82	-	-	-	-	-	-
331.1	3460.88	4394.26	3376.03	2659.35	4561.55	2764.46	1049.20	5398.91	-	2235.61	2348.48	2069.68
331.3	-	2808.11	2899.75	-	5066.84	-	-	2301.37	-	-	-	-
340.3	-	3572.97	2952.99	-	3557.71	9300.00	-	4077.52	-	-	-	2494.90
343.5	-	-	-	2963.57	-	-	-	-	-	2615.03	-	-
345.2	2268.?	1977.63	3107.77	-	2975.17	2037.98	2062.50	3237.07	-	2815.54	1921.20	3193.00
350.2	2583.?	2475.32	-	-	4814.01	-	-	2492.67	-	2487.50	-	3807.79
973.0	2923.91	-	2325.51	-	-	-	-	4116.00	2790.22	3135.29	-	3066.79
District Avg.	3453.?	3760.54	2814.03	2324.85	3637.42	3009.25	1958.19	2947.00	2790.22	2863.30	3117.97	2971.65

Table I - 2 (contd..)

DISTRICT / Industry	14 Allahabad	15 Mirzapur	16 Maint-Tea	17 Bareilly	18 Bulandshahr	19 Mathura	20 Jaunpur	21 Gorakhpur	22 Unnao	23 Sitapur	26 Industry Avg.
203.3	2569.79	-	-	2706.00	-	-	1485.71	3256.56	-	-	3159.77
211.0	2375.34	-	-	2783.45	-	-	-	-	954.82	2281.10	2923.82
300.5	-	-	-	-	-	-	-	-	2356.50	-	2994.92
308.3	-	-	-	-	-	-	-	-	-	-	2392.11
310.1	2144.65	-	-	-	-	2491.00	-	-	-	-	4490.74
321.1	-	-	-	-	-	-	-	-	-	-	5845.24
325.1	-	-	-	-	1396.24	-	-	-	-	-	1784.20
329.1	2122.00	-	2725.13	-	-	4665.20	-	2072.72	-	-	3444.96
331.1	3136.60	2490.83	-	3480.60	-	3206.41	2179.95	1983.91	5937.86	-	3542.74
331.3	-	-	3483.20	-	-	-	-	-	3016.68	-	5765.18
340.3	3656.82	-	-	-	-	-	-	-	-	3061.23	3555.47
343.5	-	-	-	1857.76	-	-	-	-	2787.39	-	2601.03
345.2	-	2089.69	-	-	-	-	2032.08	2317.76	-	-	2495.04
359.2	-	-	-	-	-	-	-	-	-	2318.33	3369.62
972.0	-	-	-	3468.00	-	-	-	3558.09	1899.00	-	2955.34
District Avg.	2635.01	2217.71	2971.86	3016.69	1356.24	4042.85	2914.10	2590.05	2462.36	2409.34	3184.1

Cost Ratios and Location

Let us now see how far new industrial activity
generated in each of the districts during 1960-75 is
related with the measures of locational advantages that
we have drawn above. We have two measures of additions
to industrial activity : new factory units started (AU)
and net increase in employment (AE) over the period.
One presumes that if adequate information is available
the entrepreneurs' decisions to locate and expand their
activity in a district would be influenced by what they
would expect to get as surplus of revenue over cost, which
can be inversely measured in terms of the cost-output
ratio; and that would depend mainly on what part of the
value of their output they expect to have to be paid for
raw material and wages.

It, however seems that the location of new industrial
activity does not bear any consistent relationship with
the pattern locational advantage of districts as portrayed
earlier. The new industrial activity measured in terms of
factories added (AU) and increase in employment (AE), when
regressed upon COR does not show any consistent relation-
ship, implying that the distribution of new industrial acti-
vity among districts is not necessarily influenced by the

locational advantages of districts as reflected in
cost output ratio (COR). The explanatory power of the
model as shown by the value of R^2 is generally low in
all-industry equation as well as in those for individual
industries (Table V - 6). (The analysis is restricted
only to 8 industry groups in which there at least seven
observations). In the equation for all-industry, bakery
and milk products and nuts and bolts the sign of coeffi-
cients is negative as expected, but coefficients are
insignificant. In others the signs are positive but again
insignificant except in case of straw board and mill board
products where coefficient of COR is significant when
related with AE; and in this case R^2 is also relatively
high.

The excercise was also attempted with COR, MOR and
wOR as independent variables explaining AU and AE (Table
V - 7). Some improvement was noticed in the results to the
extent that the explanatory power of the model increased
in most of the equations and also variables were found to
have significant coefficient in a substantial number of cases.
But so far as the overall all-industry equation is concerned
not much improvement was noticed in the explanatory power

Table V - 6
COR AND NEW INDUSTRIAL ACTIVITY

			R^2
1. All Industry	1. AU = 668.57 − 697.93 C (1.35)		0.0877
	2. AE = 18004.05 − 14568.14 C (0.42)		0.00926
2. Industry 205.3	1. AU = 12.6353 − 12.7965 C (0.5414)		0.0402
	2. AE = 334.2923 − 370.2244 C (0.7642)		0.0770
3. Industry 211.0	1. AU = 4.4034 − 1.6064 C (0.0816)		0.0007
	2. AE = −817.3647 + 932.4022 C (0.4822)		0.0251
4. Industry 280.5	1. AU = − 27.8515 + 40.6478 C (0.9562)		0.1546
	2. AE = −3969.3152 + 5196.9563 C (2.4116)**		0.5377
5. Industry 329.1	1. AU = − 1.8227 + 3.1883 C (0.2517)		0.0125
	2. AE = −227.8201 + 313.424 C (0.6552)		0.079
6. Industry 331.1	1. AU = −28.0367 + 56.6278 C (0.6403)		0.0284
	2. AE = −1543.0345 + 2768.0622 C (0.5453)		0.0139
7. Industry 340.3	1. AU = 137.1521 − 118.1806 C (0.2561)		0.0108
	2. AE = 2851.2257 − 1957.1854 C (0.1076)		0.0019
8. Industry 350.2	1. AU = −117.1622 + 138.0247 C (1.2347)		0.2336
	2. AE = −16706.2025 + 20606.2546 C (1.2772)		0.2460

** = Significant at 5%

AU = Additional Units
AE = Additional Employment
C = Cost/Price Ratio

Table V - 7 : RELATIONSHIP OF COST RATIOS WITH NEW INDUSTRIAL ACTIVITY

Industry	Dependent Variable	Constant	Coefficients of			R^2
			COR	WOR	VOR	
1	2	3	4	5	6	7
1. All	AU	+ 807.5125	- 1117.1341 (2.16373)**	+ 357.2200 (1.24796)	- 302.0297 (0.49567)	.0928
	AE	28551.9477	-66342.8685 (1.9197)***	+46200.9158 (2.5762)**	+23222.1872 (0.5843)	.1480
2. 205.3	AU	- 12.9369	+60.8271 (2.5938)**	- 39.7567 (2.2009)***	- 66.5752 (4.3916)*	.2371
	AE	- 325.3642	+1542.9626 (3.18489)**	-1041.7731 (2.7727)**	-1729.5686 (5.7129)*	.3778
3. 211.0	AU	- 0.467	- 10.9539 (0.5566)	+ 19.8123 (1.4150)	- 43.742 (0.9884)	.2863
	AE	199.2855	-4705.1065 (2.4355)**	+4589.778 (3.2409)*	11604.0395 (2.5903)**	.6336
4. 280.5	AU	- 15.8281	+ 84.5459 (1.9889)	- 65.0068 (2.6850)**	- 86.5872 (1.8837)	.7057
	AE	-3862.3727	+5748.9371 (2.6678)**	- 668.3264 (0.3719)	-1323.3215 (0.4219)	.5536
5. 329.1	AU	0.6744	+ 1.5394 (0.1215)	+ 4.9022 (0.6052)	- 32.1252 (1.5824)	.4846
	AE	- 161.478	+1115.4028 (2.3317)***	- 652.2961 (1.8941)	+2506.6754 (2.9507)**	.5257

RELATIONSHIP OF COST RATIOS WITH NEW INDUSTRIAL ACTIVITY
(contd...)

1	2	3	4	5	6	7
6. 331.1	AU	- 37.6026	- 11.6437 (0.1316)	+ 74.6264 (1.2459)	- 177.4084 (1.6441)	.1084
	AE	-2605.4633	-1213.1106 (0.1951)	+4273.3435 (1.0245)	-15403.572 (2.1424)***	.1672
7. 340.3	AU	- 842.1569	+4375.2445 (9.4825)*	-3477.5558 (14.9791)*	-4605.6742 (10.5920)*	.8795
	AE	-37585.9384	+179860.359 (9.8365)*	-139479.608 (15.5643)*	-177073.068 (10.36)*	.9044
8. 350.2	AU	- 23.676	+ 114.19 (1.0215)	+ 58.875 (0.7341)	- 299.8415 (1.4494)	.3492
	AE	-2135.512	+2948.206 (0.1798)	+759.411 (0.9066)	-40951.358 (1.8797)**	.6438

NB : Figures in brackets are 't' values of the regression coefficients

* = Significant at 1%; ** = Significant at 5%; *** = Significant at 10%

AU = Additional Units; AE = Additional Employment

COR= Cost-Output Ratio; Material Output Ratio; WOR = Wages to output ratio

of the model but COR showed a significant relationship
in expected direction with both AU and AE, though MOR also
showed such a relationship with AE but in the unexpected
direction. The equations for bakery and milk product
yielded improved R^2, and significance for coefficients of
all variables; but while MOR and WOR showed relationship
in the expected direction, COR yielded a relationships
contrary to the postulated one. Similar results/were yielded
by the estimates for industry group nuts, bolts and
metal containers. In case of oil and grain mill products
the cost ratios revealed a significant relationship with
high explanatory power with AE only; COR showed expected
but MOR and WOR unexpected signs of the coefficients. In
case of straw board and mill board both the equations
revealed a reasonably high explanatory power of the model,
MOR also showed expected and significant relationship
with AU, but with AE, COR showed an unexpected but signi-
ficant relationship.

In the case of cement and hume pipes, new factories
showed no relationship with any of the cost ratios, addi-
tional employment was found to be related with COR and
WOR but in a positive direction which is difficult to

explain. In casting and forging the situation is more
comprehensible, AU is not found related significantly
with cost ratios; but AE is found to be negatively and
significantly/with WOR. In agricultural implements,
new employment is found negatively related with the wage-
output ratio only.

The results do not enable us to come to definite
conclusions regarding the influence of total cost, raw
material and wages on location. It, however, looks that
when COR is found to significantly contribute to the inter-
district variation in new industrial activity, MOR and
WOR do not; and when former does not the latter do. In
all-industry and grain and oil mill products the former
situation prevails. It looks the variables relating to
the price of output and market rather than raw material or
labour cost seem to weigh more in general in these cases.
But in a number of other industries, the entrepreneurs seem
to get influenced by partial factors like raw material and
wage costs in locating or expanding their factories,
bakery and milk products, straw and mill board, cement and
hume pipes, bolts nuts and metal containers, and the agri-
cultural implements are such industry group. Among them

also, agricultural implements and cement and hume pipes
units have a particular influence of wage cost on their
location.

To some extent, the relationships could be rather
blurred on account of the statistical and data problems.
As mentioned earlier, prices and rates of cost variables
could probably provide more direct perception of relative
advantage than cost-output ratios, to the entrepreneurs.
Further in the analysis using all the cost ratios, the
relationships could also get diffused to the extent MOR
and WOR are components of COR, and therefore, may be strongly
related with it.

But it is quite likely that the results of our
analysis, in fact, reflect the actual position. In the
first instance, it may be argued that the entrepreneurs
have only a vague idea of locational advantages of a place
in terms of one or a few signals; and therefore, their
assessment may not be very realistic. We have seen that given
the fact that in most cases significant variations in COR
are not observed across most of the districts, the personal
factors such as domicile of the entrepreneur becomes the

deciding factor in location; and in such a situation a
consistent relationship between the slight variations
in COR, or its components and new location is highly
unlikely to be obtained. Further even if the entrepreneurs'
assessment is realistic at a given point of time, the
changing input and product market situation may prove the
assessment wrong. The cost situation depicted in the
analysis relates to the present, while locations have been
effected in the past; and therefore, a consistent influence
of the former on latter is difficult to find. Another
point to be noted is the presence of certain constraints on
location and expansion despite the advantage reflected in
low COR. Even if the COR turns out quite low in some
locations, space may not be available to start new factories
or expand old ones. In sum, while one would expect new
industrial activity to go more in locations which offer
low COR, a number of intangible and non-measurable variables
seem to lead to a pattern of location different from expected
on this basis. And this seems to have happend to a large
extent in the case of industrial activity started in Uttar
Pradesh during 1960-75.

Chapter VI

INSTITUTIONAL FACILITIES AND INCENTIVES

A number of facilities are offered by public institutions with a view to accelerating industrial development in general, and also for attracting industries to the backward areas. These facilities include the entire range of services from procuring of land, construction of sheds, assistance in the procurement of plant and machinery, feasibility studies and market surveys, to financing fixed and working capital as well as help in marketing the product. Several specialised institutions such as U.P. State Industrial Development Corporation (UPSIDC), U.P. Small Industries Corporation (UPSIC), U.P. Finance Corporation (UPFC), Pradeshiya Industrial Investment Corporation of Uttar Pradesh (PICUP), to name a few, have been created to provide the various kinds of facilities to the industries, particularly to the new ones. Besides, the State Government also assists industries directly under State Aid to Industries' Act, through the Directorate of Industries and its district offices.

While all these facilities are generally available to
industries irrespective of their location, some additional
incentives are also available to industries, in their start-
up or expansion in the district declared industrially back-
ward. For example, the UPSIC offers 51 per cent participa-
tion in equity of the new ventures in these districts
initially; rates of interest on loans from UPFC, PICUP etc.
are lower in these districts, and so is the underwriting
commission for issues relating to the ventured in backward
districts; new industries are exempted from octroi duty for
5 years; income tax rebate to the extent of 20 per cent is
granted to units in these districts; exemption on sales tax
on certain specified raw materials is granted for 5 years in
these districts as against 3 years in other districts.
Besides the Sales Tax refund scheme providing for interest-
free loan of amount equivalent to sales tax of new units is
more liberal in backward districts than in others. Sales
tax is refunded as loan for 5 years in their case as compared
to 3 years in other cases, and repayment of loan starts after
12 years in their case while for others it starts after 10
years. Then there is a Central capital subsidy in a few

specially backward districts and transport subsidies for
units located in hilly areas. The commercial banks also
offer loans at concessional rates to units in backward
districts, either on their own or under refin*and*ing arrangement
with IDBI.

Extent /Availment of Facilities

Facilities commonly available in all districts would
not make any differential impact on location of new industrial
activities. Still it may be worthwhile to examine the extent
to which the factories are availing of these facilities in
general and in backward districts in particular. In the
sample of factories covered in our study, over half (53%)
units reported as having used one facility or the other offered
by promotional and financial institutions. Assistance in the
procurement of plant and machinery was found as the most often
used facility; it consisted of two types of assistance,
procurement under hire purchase scheme available to SSI units
from UPSIC in some cases, and more often, financial assistance
from institutions and banks as term loan for purchase of
machinery. Financial assistance seems to be the most often
availed facility, as the next most frequently used assistance

is in the form of loans for meeting working capital require-
ments. Of the other kinds of facilities, land and infra-
structure, mostly under the Industrial Estates Programme,
emerges as most important, followed by assistance in the
procurement of raw material.

The percentage of units availing institutional facility
of one kind or the other falls short of 50 in Kanpur, Agra,
Saharanpur, Dehradun, Allahabad, Nainital, Bareilly and
Unnao. On the other hand, over two-thirds of the units in
Lucknow, Muzaffarnagar, Bulandshahr, Mathura and Sitapur
have taken advantage of assistance of some kind or the other.
None of the sampled units in Nainital and Dehradun reported
having availed of any facilities. Assistance in procurement
of plant and machinery is the most often availed facility in
most of the districts; 23 per cent of the sampled units
availed it in aggregate, but the percentage of such units
was over 40 in Ghaziabad, Bijnor, Saharanpur, Muzaffarnagar,
Bulandshahr and Gorakhpur. Facility relating to land was
availed by a sizeable proportion of units in Ghaziabad, Meerut,
and Bijnor. Help in procuring raw material was availed by a
good proportion of units in Varanasi, and Jaunpur. The extent

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of availment of facilities does not differ in a pattern
between the developed and backward districts, but it looks
that units located nearer the important regional centres
of the institutions could avail the facilities much more
than those located in somewhat removed from these centres.

Commercial banks top list of assisting institutions
obviously because finance, for short and long term purposes,
has been availed of by the largest number of units. In the
same vein, the next most often used institution as a source
of assistance is U.P. Financial Corporation having assisted
13 per cent of units in the sample, closely followed by
U.P.S.I.D.C. which helped 11 per cent of them. Seven per
cent of units also received assistance from Directorate of
Industries, of the State government; another 3 per cent from
NSIC and one per cent from PICUP. Commercial bank finance
has been availed of by factories in all industry groups
except repair of motor vehicles, but it has been used/by units
in oil and grain mill products, cycle tyres and tubes, glass
products, cement and hume pipes, steel pipes and metal uten-
sils. U.P.F.C. assistance has gone most often to china-ware,
nuts bolts and metal containers and basic industrial chemicals,
UPSIDC help has been availed most often by units in metal

utensils; and units in casting and forging and manufacture
of light agriculture machinery and equipment have received
assistance from Directorate of Industries, more often than
factories in other industry groups.

Factories in Kanpur, Agra, Meerut, Ghaziabad, Lucknow,
Saharanpur, Moradabad, Muzaffarnagar, Aligarh, Mirzapur,
Bareilly, Mathura, Jaunpur, Unnao and Sitapur use bank
finance more often than those in Varanasi, Bijnor, Allahabad,
Bulandshahr, and Gorakhpur. UPFC assistance has been used
most by units in Bulandshahr, followed by those in Kanpur,
Muzaffarnagar and Varanasi. UPSIDC help has gone most often
to units in Ghaziabad, Kanpur, Gorakhpur and Agra. Directorate
of Industries has been directly helpful most in Varanasi,
Agra, Aligarh, Lucknow and Jaunpur; National Small Industries
Corporation (NSIC) in Gorakhpur, Kanpur and Ghaziabad and
PICUP in Varanasi, Bijnor and Aligarh.

Facilities and Location

It looks that the facilities themselves were not very
important in location decisions, as of the 218 occasions
of availment of facilities as many as 135 cases were after
the establishment and only 83 at the time of establishment.

In Ghaziabad, Bulandshahr, Agra, Meerut, Lucknow and Saha-
ranpur, however, at least 40 per cent cases of availment of
facilities were at the time of starting the factory; and
therefore, the availability of facilities might have had
some influence on location. It may be noted that of these
only two, Ghaziabad and Bulandhshahr are in the category of
backward districts and in each of these districts, over 50
per cent units availed of facilities at the time of establish-
ment. In these cases, one can presume that special facili-
ties and incentives available for backward districts did have
some influence on the entrepreneurs' decision on location.

In order that the facilities offered by promotional
and financial institutions could influence entrepreneurs'
decisions on location, it is necessary that the facilities
differ from one location to another and entrepreneurs have
knowledge about them. As mentioned earlier, a number of
facilities are offered to all entrepreneurs in the State
irrespective of their location; but these facilities are
available on more favourable terms in 40 such districts in
the State which are declared industrially backward; and there
are a few other incentives available to units in these dis-
tricts only.

As has been seen earlier in Chapter 2, the new
industrial activity has gone to the backward districts to
a less than proportional extent, implying that the diffe-
rential concessions have not been effective in diverting
location to backward districts. Some of the backward districts
did get a fair share of new activity, but it is primarily on
account of the geographical situation of these districts;
they are in proximity of the industrially better developed
districts. It therefore looks that the incentives have had
effect only in already more advantageously located areas.
The incentives could thus be a necessary condition for loca-
tional diversification of industries, but they fail to be
a sufficient condition as well. The infra-structure and
agglomeration factors have a greater pull for attracting indus-
tries in a location, and the given nature and extent of in-
centives cannot substitute these factors in the backward
districts.

Still, one can surmise that greater dis-semination of
knowledge and awareness of the available incentives could be
of some help. We find that there is a significant lack of
awareness among entrepreneurs in regard with the facilities
available in general, and those available in the backward

, in particular

districts. About 18 per cent of them are not aware of
any of the facilities (Table VI - 1). It is possible that
entrepreneurs in non-backward districts did not bother to
know about the facilities particularly available in the
backward districts. But it is surprising that quite a few
entrepreneurs in districts in which these facilities are
available were also not aware of any facility and some were
aware of a few facilities but unaware of others. For
example, over one-third of entrepreneurs in Bulandshahr, a
backward district did not know of any of the facilities.
Among developed districts, Kanpur entrepreneurs' showed the
greatest degree of ignorance of the facilities available in
backward districts, 31 per cent of Kanpur entrepreneurs were
unaware of any such facilities. Probably Kanpur is already
fixed in their mind as the ideal location and they never
considered the relative advantages or/dis-advantages of alter-
native locations.

Of the various facilities and concessions, sales tax
refund loan, administered by PICUP seems to be the most
publicised : 53 per cent of the entrepreneurs in the sample
were aware of it, although all of them could not avail of
it as many old units were not eligible for this facility.

Table - VI - 1

Awareness of Various Facilities

	Varanasi	Kanpur	Agra	Meerut	Ghaziabad	Lucknow	Bijnor	Saharanpur	Dehra Dun	Moradabad	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Buland-shahr	Mathura	Jaunpur	Gorakhpur	Unnao	Sitapur	Total
Central Capital Subsidy	6	9	1	2	11	3	1	1	1	2	1	1	3	2	3	1	1	1	2	6	1	1	55
Sales Tax Refund	7	19	21	4	26	4	3	12	1	10	4	10	6	1	2	6	6	5	1	2	4	4	156
Equity Participation	2	16	10	2	19	2	3	4	1	3	4	5	6	2	2	4	2	3	2	2	4	3	100
Loan University Commissions	5	10	5	2	12	4	1	1	1	3	3	4	4	2	1	2	4	1	1	1	3	2	67
Income Tax Rebate	9	15	17	2	19	4	2	8	1	11	4	7	10	2	1	6	9	4	1	1	4	4	139
Lower Rate of Interest on term loan	17	20	13	3	21	7	1	6	1	3	3	4	9	3	1	2	6	3	2	6	7	3	142
Transport Subsidy	1	7	1	1	7	2	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	27
Sales Tax Exemption	16	23	9	2	17	4	2	7	1	3	6	3	8	4	3	3	4	3	2	1	6	4	135
Exemption from Electricity Duty	12	16	5	1	16	3	1	1	1	6	4	1	2	3	1	2	4	1	3	1	4	2	83
Lower Deposit Money Service Charge, etc.	8	16	1	1	8	3	1	1	1	1	2	2	6	3	1	1	1	1	2	1	2	1	57
Units not aware of any Facility	1	16	4	1	5	1	1	2	1	2	1	4	1	1	1	3	6	1	1	3	2	1	52
No. of Units in the Sample	20	51	30	6	36	8	4	16	2	16	7	16	12	4	3	10	17	5	3	10	9	5	292

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But still it is surprising that such a facility which
gives substantial financial assistance, equivalant to
three years' sales tax in developed and five-years' sales
tax in backward districts free of interest for 10-12 years, is
not known to a large number of entrepreneurs. Around half
the entrepreneurs are aware of the following facilities to
units in backward districts : lower interest rates on term
loans, income tax rebate and sales tax exemption; and over
one-third know about equity participation by public institu-
tions. Even here a significant proportion of units in back-
ward districts do not know about these facilities. Even
the facility of exemption from electricity duty is unknown
to a significant number of entrepreneurs. We have no
district in the sample in which units are eligible for central
capital subsidy; still 19 per cent entrepreneurs know about
it. Similarly some entrepreneurs far away from the hills also
know about the transport subsidy; most of those located in
Dehradun and Nainital, of course, certainly are fully aware
of it.

Adequacy and Relative Importance of Incentive

In over three-fourths cases entrepreneurs of factories
located in developed districts' were aware of the concessions
and incentives available for locating industrial activity in

the backward districts. Why did they not locate factories
in backward districts? Of course, 32 per cent of them were
already established before the incentives started operating,
or they came to know about them (Table VI - 2). But 47 per
cent of them just did not bother, probably either because
they had other reasons for locating their factories where
they are or then, thought that incentives offer no special
advantage over what they have at location of their choice.
It is found 28 per cent had personal preference for their
present location; and 12 per cent considered the procedure
of availing the incentives very cumbersome and time consum-
ing. That the incentives were inadequate was offered as an
explanation by a sizeable number of units in Varanasi and
Lucknow; most Kanpur units were already established but of
the newly established ones most did not bother and had perso-
nal preferences for Kanpur. Most of the entrepreneurs in
Agra, Saharanpur, Bareilly and Aligarh just did not bother
about the proposition of locating in backward districts
despite incentives.

The factories located in backward districts, as expected,
were better aware of the facilities and incentives available
to them. Fifty five per cent of them were already located
before the incentives started operating; each one of the rest

Table VI : 2

Reasons for not Locating in Backward Districts
(Units in non-backward districts only)

Reasons	Varanasi	Kanpur	Agra	Meerut	Lucknow	Bijnor	Saharanpur	Dehradun	Muzaffar-nagar	Aligarh	Allahabad	Mirzapur	Nainital	Bareilly	Gorakhpur	Total
Did not bother	10	5	25	1	4	2	9	2	-	11	6	1	-	6	3	85
Already Established	9	27	5	1	1	-	3	-	1	-	2	4	2	-	4	58
Personal Preference	14	10	1	1	2	-	4	-	1	3	6	3	-	2	3	50
Inadequate assistance	10	-	-	-	2	-	-	-	-	-	-	1	1	1	-	14
Cumbersome and time consuming procedure	10	1	-	2	1	-	1	-	-	-	1	2	-	1	3	22
Any other	4	8	-	4	2	-	1	-	-	-	1	1	-	-	-	20
Total	57	51	31	9	12	2	18	2	7	14	16	11	3	9	13	249
Total number of units in each district	20	51	31	6	8	4	16	2	7	18	12	4	3	10	10	202
No. of units Responding	20	47	31	5	8	2	15	1	1	15	12	4	3	9	7	180

considered some incentive or the other as an important
consideration for deciding to locate in a backward
district. Different incentives were obviously/given the
same importance. In terms of the importance the entre-
preneurs attached to them, the various facilities availed
by them could be ranked as follows:

1. Income Tax Rebate,

2. Exemption from sales tax,

3. Sales tax refund loan,

4. Lower rates of interest on term loan by UPFC,

5. Equity participation by UPFC,

6. Lower underwriting commission,

7. Exemption from electricity duty,

8. Transport subsidy, and

9. Lower earnest money.

It appears that the 'directness' of a benefit rather
than the quantum and long-term usefulness weighs more with
the entrepreneurs in assessing relative importance of in-
centives. Thus fiscal incentives, in terms of tax concession
are upper most in their mind, even though the magnitude of
benefit on this account may be less than the interest free
term loans granted under sales tax refund loan scheme.

Assistance that goes to reduce cost or make necessary inputs readily available seems less important than tax exemption on produced output or earned income. This proportion is further strengthened by the pattern of suggestions that the entrepreneurs gave for improvement in the system of assistance from public institutions. In the first instance they were rather vague in their responses; only about one-third of the sampled entrepreneurs, mostly those having availed of some facility, responded. The largest number, 34 per cent, felt that the extent of facilities should be enhanced. Specifically, it meant higher rebate in income tax, and exemption from sales tax for a larger period, followed by lower rate of interest on loans and loans covering a larger proportion of fixed and working capital requirements. A good number of entrepreneurs also suggested that the institutions should help the units in procuring raw materials, a few also felt the need for marketing through the sales depots to be established by the institutions, and another few wanted technical assistance to be extended by institutions wherever needed. In the sphere of administration of facilities, about one-eighth of those responding were specific in suggesting that there should be a single agency administering the various kinds of assistance and facilities, and one-

fifth suggested reduction in paper work and procedures. Some of them felt that the facilities, incentives etc. need to be publicised to a greater extent as many entre-preneurs did not know about them.

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Chapter VII
CONCLUSION

The factory sector of industries in Uttar Pradesh
has undergone a significant structural change during
the last two decades. The modern sector of industries,
such as chemicals and engineering has grown relatively
fast while the traditional industries such as sugar and
textiles have not kept pace with overall industrial
development. The share of industries based on raw materials
from agriculture, animal husbandry and forestry has declined
marginally; that of consumer goods industries based on non-
local raw materials has declined significantly; while the
capital and intermediate products industries have gained
substantially. On the whole, industries with raw material
based location declined in relative importance while foot-
loose industries increased their share substantially. This
change has made the State's industrial structure locationally
more diversifiable.

Trends in Diversification

In fact, however, the overall spatial structure of
industries remained as concentrated in 1975 as it was in
1960. The most significant change noticed is that, Kanpur

contributed only 17 per cent of factory employment in
1975 as against 26 per cent in 1960, while Meerut (includ-
ing Ghaziabad) has 14 per cent of factory employment in
1975 as against 11 per cent in 1960. The five industrially
most important districts, Kanpur, Meerut, Lucknow, Agra
and Gorakhpur together claimed 57 per cent of factory
employment in 1960 and 55 per cent in 1975. The 10 indus-
trially least developed districts of the State claimed
1.10 per cent of factory employment in 1960 while their
share declined to 0.56 per cent in 1975. The five regions -
Eastern, Central, Western, Bundelkhand and Hill had 20, 37,
38, 2 and 3 per cent of share in factory employment in 1960;
and 18, 26, 49, 3 and 3 per cent respectively in 1975.
Thus the Central region lost ground heavily while the Western
gained. The notified backward districts as a whole also
experienced a decline in their share of factory employment
from 15 to 13 per cent. The new factories going to the
backward districts, also went mainly to such of them which
are in the vicinity of industrially better developed districts.

Industrial structure of most of the districts is of a
highly 'specialised' nature : only a few industries account
for most of industrial activity. Industrial backwardness

and lack of diversified structure are closely associated. Only a few districts, Meerut, Kanpur, Agra, Varanasi, Moradabad, Aligarh and Lucknow have almost as diversified structure as of the State as a whole, and all these districts are industrially better developed. A study of specialisation pattern of districts reveals that certain clusters of inter related industries either already exist; or, there is potential for developing them; and, with proper planning some clusters or the other can be developed in each of the districts. Such existing and potential clusters have been tentatively identified in our analysis. Use of a cluster-approach gets further support from the findings regarding the relationship between the base and incremental industrial activity. The new industrial activity has gone to the districts where the total industrial activity has had relatively high level already; but in an individual industry the new factories and additional employment is not necessarily found to have been located in districts where the units in the same activity already existed; it has at least not gone to various districts in the same proportion. In a significant number cases, the additional activity in an industry has gone to districts more or less in proportion to the existence of another but inter-related industry.

Factors in Location

An exercise to explain inter-district variations in
the location of new industrial activity added during 1960-
75 in terms of some macro-variables pertaining to level
of agricultural development, infrastructure and promotional
efforts by the public institutions, suggests that they can
produce significant results in combination, but not in
isolation of each other. Infrastructure items such as
transport network, power consumption and banking facilities
also are able to attract new factories in a district only
when the district is favourably placed in terms of level of
agricultural development, and special efforts are made by
State agencies in this regard. The promotional efforts
made by the State institutions (UPSIDC, UPFC and PICUP),
measured in terms of financial assistance rendered by them
to industries in each of the district, however, seem to
produce results even independently of the other factors.
The finding implies that these institutions have been and
can/effective in getting industrial activities located even
in districts which are not very favourably placed in terms
of general level of economic and infrastructure development.

While the significance of raw material availability
and proximity to the market as factors in location cannot
be denied their adequacy to explain the location pattern
in ~~entirety~~ *entirely* is rather doubtful. There are at least two
propositions which suggest themselves as promising hypothe-
sis for explaining the locational pattern of new industrial
activity. One, as the industrial economy of a region grows,
the significance of basic raw material as a locational fa-
ctor declines due to the emergence and increasing proportion
of industries which are not based on the local weight-losing
raw material; and the proximity to the final consumption-
head also becomes less significant, to the extent, with
the emergence of technology involving greater degree of
input-output relationship among industries, manufacturing
sector itself provides market for an increasing part of its
product. Availability of universal intermediaries and
infrastructure, and agglomeration emerge as more important
factors in location. Second, there appears to be a high
degree of indivisibility of the influences produced by
different factors in location, they produce results in
unison, but in isolation most of them lose significance.

The above conclusion based on the overall analysis
of location pattern, gets further support from the find_
ings relating to the entrepreneurs' own assessment of
the various factors that influenced their decision on
location of their factories. The fact that an overwhelm-
ing proportion of entrepreneurs state preference for their
native place as a factor in location of their factories,
on the face it, suggests as if the entreprise is the most
immobile agent of production, and therefore, entrepreneur's
personal preference is the deciding factor in location
most often. -In fact, however, it looks that availability
of infrastructure and development of procurement facili-
ties for raw material, have reduced the differences in
locational advantages to a great extent, and finding one
place almost as good as another, the entrepreneur prefers
to be at home. This statement should, however be read in
the context of the pattern of location of new factories and
employment in the sample. As we have seen most of them
are to be found in the districts and locations which are
relatively better developed industrially. It must, however,
be noted that in most cases the raw material is not produced
locally, although it may be procured locally by the manufac-

turers; and most of the output is also not <u>consumed</u>
locally, although it may be <u>sold</u> locally. Therefore, when
the entrepreneurs gave importance to the proximity to the
raw material source or the market, what in fact is implied
is the availability of arrangements for procuring the
material and selling the product locally. And existence
of these arrangements is primarily a function of the level,
concentration and agglomeration of industrial activity on
the one hand, and availability of infrastructure on the
other, both of which are mostly found to go together.

The entrepreneurs' preference for his native place is,
therefore, not absolute; the general assessment of the
place as a suitable location on economic grounds works
behind his decision. That is probably the reason as to
why despite a heavy weight of seemingly personal non-economic
consideration in the location of factories the entrepreneurs
have not faced many location specific problems in their
operations. The problems they face are mostly of general
nature common to all locations in the State. The most
often reported problem has been that of availability of
power which affected units in all locations more or less to
a similar extent.

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Comparative Advantage of Different Locations

In terms of costs and realised value of output differences are not found very wide in most cases, though in some, mostly raw material based industries, the range of cost to output ratio (COR) is rather wide reflecting the variations in the price of raw material. Comparative cost advantage, however marginal, may theoretically be expected to get reflected in location pattern, but we do not find strong evidence of such a relationship. The entrepreneurs' assessment is thus either based on some broad indicators, such as the fact that quite a few units are already doing well in a location. Very precise cost estimates of each of the inputs and the likely price of the product do not seem to get considered in each and every location decision. It may also be noted that many a time the marginal differences in cost and market situation as assessed by the entrepreneur are outweighed by the personal preference for the native place.

The CORs inevitably point to some least cost or most advantageous location. But what is significant to note is that in no industry we find just one such location, going

away from which increase the disadvantage in proportion
to distance. There are found to be two or three ~~here~~
most advantageous location (MAL) points, usually one in
each region, Eastern, Western and Central regions of
the State. Within the region the advantage tends to
generally decline with distance from that point. This
finding suggests that for planning industrial development
of the State, and for devising incentive schemes to
attract industries to backward areas, a regional approach
is necessary, as the space does not remain a continuous
variable across the entire State; but it does behave that
way in a given region. Incentives in backward districts
in a region could also be related with the disadvantage
a district offers in relation to the MAL point in that
region; and of course, the compensation by way of subsidies
and incentives have to be proportionate to the degree of
disadvantage measured in terms of the difference of COR
in a location over that in the most advantageous location.
To the extent the COR moves in line with the distance from
the MAL, distance in space itself can make the basis for
grading the incentives and subsidies.

Incentives for Backward Area Location

The existing incentives and other forms of assistance
are not so graded as to provide differential benefit in
proportion to the degree of disadvantage of a location. But
units in all the backward districts are provided with a
uniformly higher degree of concessions by way of these
incentives. The impact of these incentives seem limited
for various reasons. Many entrepreneurs are not even aware
of the existence of these facilities; many of those aware
of them do not consider the incentives adequate to compen-
sate them for the disadvantage of going to a backward
rather than a non-backward districts, and some feel that
procedure for availing the stipulated assistance is rather
cumbersome and time-consuming. Yet quite a few entrepre-
neurs decided to locate their units in a backward district
due to the availability of some incentives. But most of
them give highest importance to tax concessions; assistance
which reduces cost of their output directly is not as
popular as the fiscal incentives based on the final product
or income.

Conclusion

It is, however, quite clear that incentives,
fiscal or financial as in existence, play only a marginal
role in the diversification of industries. All evidence
points to the fact that infrastructure and agglomeration
have emerged as the major determinants of location oversha-
dowing the importance of the location of raw materials and
markets, the disadvantages on account of which could be
compensated to some extent by incentives. For diversifi-
cation of industries, today, even infrastructure does not
seem the major bottleneck except in remote and highly back-
ward areas. What needs to be recognised squarely is that
industries survive and grow where other, particularly
inter-related industries exist. Providing incentives to
attract one or a few units in unrelated branches of indus-
try is highly unlikely to succeed in developing the area
industrially. Planning of development of industries mutua-
lly supporting each other and using and providing certain
common facilities for the promotion of skills, entrepreneu-
rial training, economy in raw material procurement and
marketing would alone prove effective in industrial develop-

ment of backward areas. Findings of our study have
provided substantial evidence to this effect as well
some guidelines for the direction in which action needs
to be taken in various regions of the State of Uttar
Pradesh.

Such an approach is, however, not feasible for
application in all areas simultaneously. It may not even
be economically desirable, due to the reasons of the
immediate high costs, to plan for rapid industrialisation
of the most backward and remote areas lacking even the
minimum infrastructure. The most practical method seems
to be to use the regional growth points which have already
developed in each region of the State as the focal points
and plan, in the first instance development of industries
related with those operating in the most advantageous
locations as identified earlier, in the areas and districts
in/their proximity; and then gradually move to greater dis-
tance and more backward areas, shifting the focal point
to the newly developed areas in the process. This process,
besides being economically practicable in the short run,
will alone prove effective in industrial development of
backward areas in the long run.

Appendix Table : 1

Factories and Factory Employment in U.P. : 1960 and 1975
(by industry groups)

Sl. No.	Industry Groups	1960		1975		Addition (1960-75)	
		Units	Employment	Units	Employment	Units	Employment
1	2	3	4	5	6	7	8
1.	010	16 (0.65)	498 (0.18)	1 (0.02)	18 (0.00)	-15 (-0.74)	-480 (-0.38)
2.	202	7 (0.28)	383 (0.14)	14 (0.31)	4100 (1.04)	7 (0.34)	3717 (2.98)
3.	203	14 (0.57)	621 (0.23)	12 (0.27)	778 (3.20)	-2 (-0.10)	157 (0.13)
4.	205	262 (10.60)	4929 (1.83)	233 (5.18)	4141 (1.05)	-29 (-1.43)	-788 (-0.63)
5.	206	7 (0.28)	276 (0.10)	34 (0.75)	963 (0.24)	27 (1.33)	687 (0.55)
6.	207	304 (12.30)	60561 (22.52)	766 (17.02)	79821 (20.29)	462 (22.80)	19260 (15.47)
7.	208	2 (0.08)	86 (0.03)	1 (0.02)	41 (0.01)	-1 (-0.04)	45 (-0.04)
8.	209	138 (5.58)	7931 (2.95)	197 (4.38)	8029 (2.04)	59 (0.91)	98 (0.08)
9.	211	15 (0.61)	1074 (0.40)	9 (0.20)	1683 (0.43)	-6 (-0.30)	609 (0.49)
10.	212	1 (0.04)	103 (0.04)	1 (0.02)	59 (0.01)	(-)	-44 (-0.03)
11.	213	-	-	7 (0.15)	1563 (0.40)	7 (0.34)	1563 (1.25)
12.	214	1 (0.04)	34 (0.01)	7 (0.15)	617 (0.16)	6 (0.30)	583 (0.47)
13.	220	7 (0.28)	382 (0.14)	26 (0.58)	11475 (2.92)	19 (0.94)	11093 (8.91)
14.	231	96 (3.88)	63828 (23.73)	184 (4.09)	57776 (14.68)	88 (4.34)	-6052 (-4.86)

Appendix Table : 1 (contd.)

1	2	3	4	5	6	7	8
15.	232	16 (0.65)	665 (0.25)	8 (0.18)	106 (0.03)	-8 (-0.39)	-559 (-0.45)
16.	233	1 (0.04)	196 (0.07)	48 (1.07)	2324 (0.59)	47 (2.31)	2128 (1.71)
17.	239	16 (0.65)	1756 (0.65)	8 (0.18)	91 (.0.02)	-8 (-0.39)	-1665 (-1.34)
18.	241	39 (1.58)	3979 (1.48)	27 (0.60)	3928 (0.97)	-12 (-0.60)	-51 (-0.04)
19.	242	1 (0.04)	14 (0.00)	-	-	-1 (-0.05)	-14 (-0.01)
20.	243	2 (0.08)	202 (0.07)	11 (0.24)	300 (0.07)	9 (0.44)	98 (0.08)
21.	250	23 (0.93)	1214 (0.45)	32 (0.71)	1561 (0.40)	9 (0.44)	347 (0.28)
22.	260	12 (0.48)	454 (0.17)	8 (0.18)	250 (0.06)	-4 (-0.20)	-204 (-0.16)
23.	271	14 (0.57)	1586 (0.59)	70 (1.56)	4402 (1.12)	56 (2.76)	2816 (2.26)
24.	280	208 (8.41)	9947 (3.70)	207 (4.60)	17988 (4.57)	-1 (-0.05)	8041 (6.46)
25.	291	81 (1.25)	3218 (1.20)	85 (1.89)	4210 (1.07)	54 (2.66)	992 (0.80)
26.	292	5 (0.20)	166 (0.06)	-	-	-5 (-0.25)	-166 (-0.13)
27.	300	5 (0.20)	56 (0.02)	106 (2.35)	4472 (1.10)	101 (4.94)	4416 (3.20)
28.	311	24 (0.97)	2530 (0.94)	109 (2.42)	8706 (2.21)	85 (4.19)	6176 (4.96)
29.	312	1 (0.04)	15 (0.00)	16 (0.35)	600 (0.15)	15 (0.74)	585 (0.47)
30.	319	46 (1.86)	2129 (0.79)	136 (3.02)	6544 (1.66)	90 (4.44)	4415 (3.55)
31.	321	13 (0.52)	189 (0.07)	1 (0.02)	6 (0.00)	-12 (-0.59)	-183 (-0.15)

Appendix Table : 1 (contd.)

1	2	3	4	5	6	7	8
32.	322	2 (0.08)	153 (0.06)	-	-	-2 (-0.10)	-183 (-0.12)
33.	331	4 (0.16)	103 (0.04)	7 (0.15)	229 (0.06)	3 (0.15)	126 (0.10)
34.	332	191 (7.73)	14856 (5.52)	260 (5.78)	37826 (9.61)	69 (3.40)	22970 (18.45)
35.	333	5 (0.20)	268 (0.10)	19 (0.42)	1694 (0.43)	14 (0.69)	1426 (1.14)
36.	334	1 (0.04)	1315 (0.49)	7 (0.15)	2809 (0.71)	6 (0.30)	1494 (1.20)
37.	339	49 (1.98)	1328 (0.04)	49 (1.09)	1282 (0.32)	-	-46 (-0.03)
38.	341	83 (3.36)	5808 (2.16)	423 (9.40)	17828 (4.53)	340 (16.78)	12020 (9.65)
39.	342	29 (1.17)	1124 (0.42)	70 (1.56)	7883 (2.00)	41 (2.02)	6759 (5.43)
40.	350	139 (5.62)	5432 (3.02)	462 (10.27)	14710 (3.74)	323 (15.94)	9278 (7.45)
41.	360	251 (10.15)	13524 (5.03)	267 (5.93)	14704 (3.73)	16 (0.79)	1180 (0.95)
42.	370	17 (0.69)	827 (0.31)	125 (2.78)	9847 (2.50)	108 (5.33)	9020 (7.24)
43.	382	18 (0.73)	25305 (9.41)	18 (0.40)	28712 (7.06)	-	3407 (2.47)
44.	383	1 (0.04)	36 (0.01)	28 (0.62)	4304 (1.09)	27 (1.33)	4268 (3.43)
45.	384	111 (4.49)	13264 (4.93)	157 (3.49)	19443 (4.94)	46 (2.27)	6179 (4.96)
46.	385	15 (0.61)	493 (0.18)	45 (1.00)	2091 (0.53)	30 (1.48)	1598 (1.28)
47.	386	3 (0.12)	208 (0.08)	3 (0.06)	383 (0.10)	-	175 (0.14)
48.	389	8 (0.32)	789 (0.29)	-	-	-8 (-0.39)	-789 (-0.63)

Appendix Table : 1
(contd..)

1	2	3	4	5	6	7	8
49.	391	16 (0.65)	427 (0.16)	32 (0.71)	839 (0.21)	16 (0.79)	412 (0.33)
50.	392	2 (0.08)	25 (0.01)	3 (0.06)	53 (0.01)	1 (0.05)	28 (.0.02)
51.	393	8 (0.32)	85 (0.03)	2 (0.04)	547 (0.14)	-6 (0.30)	542 (0.36)
52.	394	1 (0.04)	21 (0.01)	-	-	-1 (-0.50)	-21 (-0.02)
53.	395	16 (0.65)	1388 (0.52)	6 (0.13)	401 (0.10)	-10 (-0.49)	-987 (-0.79)
54.	396	32 (1.29)	2106 (0.78)	20 (0.44)	959 (0.24)	-12 (-0.59)	-1147 (-0.92)
55.	399	60 (2.43)	4486 (1.67)	21 (0.47)	723 (0.18)	-39 (-1.92)	-3763 (-3.02)
56.	511	63 (2.55)	5098 (1.89)	57 (1.27)	10785 (2.65)	-6 (-0.30)	5685 (4.57)
57.	512	3 (0.12)	212 (0.08)	6 (0.13)	130 (0.03)	3 (0.15)	-82 (-0.06)
58.	521	16 (0.65)	1188 (0.44)	55 (1.22)	2012 (0.51)	39 (1.92)	824 (0.66)
59.	522	1 (0.04)	52 (0.02)	-	-	-1 (-0.05)	-52 (-0.04)
60.	844	1 (0.04)	17 (0.01)	11 (0.24)	196 (0.05)	10 (0.50)	179 (0.14)
Total(whole U.P.)		2473	268970	4517	406940	2044	137970

Source : Compiled from the registers maintained by the Chief
Inspector of Factories, U.P., Kanpur.

Appendix Table : 2

Factories and Factory Employment in U.P. in 1960 and 1975

Districts	1960		1975		Addition (1960-75)		Percentage to grand total					
	Units	Employ-ment	Units	Emplo-yment	Units	Employ-ment	(1)	(2)	(3)	(4)	(5)	(6)
0	(1)	(2)	(3)	(4)	(5)	(6)						
Eastern Region												
Allahabad	117	8269	137	13505	20	5236	4.73	3.07	3.03	3.32	0.98	3.80
Azamgarh	4	323	48	2093	44	1770	0.16	0.12	1.06	0.51	2.15	1.28
Bahraich	33	1148	29	1051	-4	-97	1.35	0.43	0.64	0.26	-0.19	-0.07
Ballia	3	67	2	138	-1	71	0.12	0.02	0.04	0.03	-0.05	0.05
Basti	10	2410	11	2289	1	-121	0.40	0.90	0.24	0.56	0.05	-0.09
Deoria	20	9330	21	8206	1	-1124	0.81	3.47	0.46	2.02	0.05	-0.81
Faizabad	15	1387	19	1641	4	254	0.61	0.51	0.42	0.40	0.19	0.18
Ghazipur	3	674	7	843	4	169	0.12	0.25	0.15	0.21	0.19	0.12
Gonda	27	2191	21	2711	-6	520	1.09	0.81	0.46	0.67	-0.29	0.38
Gorakhpur	46	14587	64	16003	18	1416	1.86	5.42	1.42	3.93	0.088	1.03
Jaunpur	10	927	15	618	5	-309	0.40	0.34	0.33	0.15	0.24	-0.22
Mirzapur	31	3565	46	12355	15	8790	1.25	1.32	1.02	3.04	0.73	6.37
Pratapgarh	1	36	4	101	3	65	0.04	0.01	0.09	0.02	0.15	0.05
Sultanpur	2	66	4	150	2	84	0.08	0.02	0.09	0.04	0.10	0.06
Varanasi	122	7642	195	11267	73	3625	4.93	2.84	4.32	2.77	3.57	2.63
Total	444	52622	623	72971	179	20349	17.96	19.56	15.79	17.93	8.76	14.75

Appendix Table : 2
(contd..)

0	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Central Region												
Barabanki	5	1112	6	1096	1	-16	0.20	0.41	0.13	0.27	0.05	-0.01
Fatehpur	10	260	13	313	3	53	0.40	0.10	0.29	0.08	0.15	0.04
Hardoi	4	690	3	1037	-	347	0.15	0.26	0.07	0.25	-0.05	0.25
Kanpur	362	69259	626	68175	264	-1084	14.64	25.75	13.86	16.76	12.92	-0.79
Lucknow	165	22247	232	27669	67	5422	6.67	8.27	5.14	6.80	3.28	3.93
Rae Bareli	1	14	7	1007	6	993	0.04	0.00	0.15	0.25	0.29	0.72
Sitapur	16	3437	36	4009	20	572	0.65	1.28	0.80	0.98	-0.98	0.41
Unnao	6	652	47	2272	41	1620	0.24	0.24	1.04	0.56	2.01	1.17
Kheri	20	2278	38	1174	18	-1104	0.81	0.85	0.84	0.29	0.88	-0.80
Total	589	99948	1008	106752	419	6803	23.83	37.16	22.32	26.23	20.50	4.93
Bundelkhand Region												
Banda	13	194	4	67	-9	-127	0.52	0.07	0.09	0.02	-0.44	-0.09
Hamirpur	2	159	1	82	-1	-77	0.08	0.06	0.02	0.02	-0.05	-0.06
Jalaun	3	73	3	83	-	10	0.12	0.03	0.07	0.02	-	0.01
Jhansi	37	4257	43	12474	6	8187	1.50	1.59	0.95	3.06	0.29	5.93
Total	55	4713	51	12706	-4	7993	2.22	1.75	1.13	3.12	-0.19	5.79
Hill Region												
Almora	3	524	5	245	2	-279	0.12	0.19	0.11	0.06	0.10	-0.20
Pratapgarh	-	-	1	20	1	20	-	-	0.02	0.00	0.05	0.01
Dehradun	48	3953	96	8399	48	4446	1.94	1.47	2.13	2.06	2.35	3.22
Garhwal	3	200	6	136	3	-64	0.12	0.07	0.13	0.03	0.15	-0.05
Chamoli	-	-	-	-	-	-	-	-	-	-	-	-

Appendix Table : 2
(contd..)

(0)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Nainital	36	2239	43	4044	17	1805	1.05	0.83	0.95	0.99	0.83	1.31
Tehri												
Garhwal	3	139	1	17	-2	-122	0.12	0.05	0.02	0.00	-0.10	-0.09
Uttar Kashi	-	-	1	250	1	250	-	-	0.02	0.06	0.05	0.18
Total	83	7055	153	13111	70	6056	3.36	2.62	3.39	3.22	3.42	4.39
Western Region												
Agra	390	18240	558	44925	168	26685	15.76	6.78	12.35	11.04	13.22	19.34
Aligarh	132	2093	205	13113	74	4020	5.34	3.38	4.54	3.22	3.57	2.91
Bijnor	47	4471	260	12088	213	7617	1.90	1.66	5.76	2.97	10.42	5.52
Badaun	9	199	15	657	6	458	0.36	0.07	0.33	0.16	0.29	0.33
Bareilly	65	6478	82	9781	17	3303	2.63	2.41	1.82	2.40	0.83	2.39
Bulandshahr	32	1561	16	1194	-16	-367	1.29	0.58	0.35	0.29	-0.78	-0.27
Etah	6	977	16	1068	10	91	0.24	0.36	0.35	0.26	0.49	0.07
Etawah	38	937	52	1853	14	916	1.54	0.35	1.15	0.46	0.68	0.66
Farrukhabad	34	1102	30	996	-4	-106	1.37	0.41	0.66	0.24	-0.20	-0.08
Mainpuri	25	3476	32	1995	-7	-1481	1.01	1.29	0.71	0.49	0.34	-1.07
Mathura	28	1275	69	2055	41	780	1.13	0.47	1.53	0.50	2.01	0.57
Meerut	211	30221	710	57271	499	27050	8.53	11.24	15.72	14.07	24.41	19.61
Moradabad	58	4377	167	10286	109	5969	2.35	1.61	3.70	2.53	5.33	4.33
Muzaffarnagar	98	6220	252	15348	154	9129	3.96	2.31	5.58	3.77	7.53	6.62
Rampur	8	2070	29	2506	21	436	0.32	0.77	0.64	0.62	0.03	0.32
Pilibhit	5	989	7	2232	2	243	0.20	0.74	0.15	0.55	0.10	0.18
Saharanpur	82	10301	131	19196	49	8675	3.32	3.83	2.90	4.72	2.40	6.45
Shahjahanpur	33	1798	80	3929	47	2131	1.33	0.67	1.77	0.97	2.30	1.34
Total	1301	104725	2717	200493	1410	93768	52.63	38.94	60.02	49.27	68.98	69.41
Grand total Whole U.P.	2473	268970	4517	406940	2044	137970						